

Analysis of line positions and strengths of H<sub>2</sub><sup>16</sup>O ground and hot  
bands connecting to interacting upper states: (020), (100),  
and (001)

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## ABSTRACT

High-resolution spectra of  $H_2^{16}O$  were recorded with a Fourier-transform spectrometer covering transitions in the (020)-(010), (100)-(010), and (001)-(010) bands from 1100 to over  $2300\text{ cm}^{-1}$ . Also included in the study were previously reported measurements of these bands and measurements of the (020)-(000), (100)-(000), and (001)-(000) bands from  $2620\text{ cm}^{-1}$  to  $4500\text{ cm}^{-1}$ . The line strengths were fitted to a model which takes into account the interactions between the vibrational states (020), (100), and (001). The model included dipole moment matrix elements (also referred to as transition elements) represented by 19 expansion coefficients for B-type transitions and 14 expansion coefficients for A-type band, transitions. The most satisfactory results were obtained when the relative signs and values of the leading dipole moment terms of each of the three "hot" bands were as follows:  $u(020-010)=1.936(97)\times 10^{-1}\text{ D}$ ,  $u(100-010)=3.876(19)\times 10^{-2}\text{ D}$ , and  $u(001-010)=2.523(75)\times 10^{-2}\text{ D}$ . Hot water emission experimental frequencies from other studies were included in an analysis to obtain rotational energies for levels up to high  $J$  and/or  $K_a$  of the (020), (100), and (001) vibrational states. The results from this study provide a more accurate representation of the parameters than those available at present for the six bands.

## 1. INTRODUCTION

In a recent paper (1), I reported measurements of line positions and strengths in the (000)-(000), (010)-(010), and (010)-(000) bands of  $H_2^{16}O$  covering the region between 590 and 2582  $\text{cm}^{-1}$ . Many of the spectra used in that study were measured and analyzed in the present work to obtain experimental values of line positions and strengths for the (020)-(010), (100)-(010), and (001)-(010) bands of  $H_2^{16}O$ . These results compliment observations reported in two previous studies (2,3) by this author in which line positions and strengths were given for the (020)-(010) and the (020)-(000) bands in one paper (2) and comparable data for the (100)-(010), (001)-(010), (100)-(000), and (001)-(000) bands in the other investigation (3). In both studies (2,3), the measured line strengths were analyzed without considering vibration-rotation interactions between the upper states. In the present study, the line strengths were analyzed using perturbation theory. This involves interactions between the "hot" bands in the lower spectral region and interactions between the ground state bands in the  $2.7\mu\text{m}$  spectral region.

The experimental line positions obtained in this work and previous results (2,3) were used in conjunction with measurements from other studies (4-6) to obtain high accuracy experimental values of rotational energy levels for the (020), (100), and (001) vibrational states of  $H_2^{16}O$ . Brief descriptions of each of the other studies are the following: laboratory hot water emission spectra between 370 and 930  $\text{cm}^{-1}$  given by Polyansky et al. (4), hot

water data by Polyansky et al. (5) covering the (020)-(010) band, and microwave data given by Pearson et al. (6).

## 2. LINE POSITIONS AND ENERGY LEVELS

The line positions measured in this work were used along with measurements from other reports (2-6) to determine upper state rotational energy levels. In one study, Polyansky et al. (4) measured hot water emission spectra covering the region from 370-930 cm<sup>-1</sup> and provided information on quantum assignments of observed line frequencies involving H<sub>2</sub><sup>16</sup>O transitions for vibrational transitions ranging from the (000)-(000) band upward and beyond the (001)-(001) band with J ≤ 38. However several of their (4) reported values were found to be  $4.5 \times 10^4$  cm<sup>-1</sup> higher than measured frequencies given in my recent study (1) with an uncertainty of  $\pm 3.2 \times 10^4$  cm<sup>-1</sup>. In contrast, the measurements in another report by Polyansky et al. (5), involving emission spectra of the (020)-(010) band, were found to be accurate to better than  $1.2 \times 10^4$  cm<sup>-1</sup>, on the average, with no calibration correction.

Values of the rotational energy levels in the (020), (100), and (001) states were determined from the measurements by the addition to each measured transition frequency, the appropriate lower state energy level. The values of the (000) and (010) states reported in ref. (1) were used in this procedure. The results obtained in this fashion were weighted and averaged for each level with the highest weight given to the few available microwave (6) measurements. Frequencies from the far-infrared emission study (4)

were only used in the analysis when necessary.

Table 1 lists the results from the analysis for the (001), (100), and (020) states which includes estimates for the associated uncertainties given within parentheses. Levels labeled with an asterisk placed directly past the energy level value were derived with the aid of the far-infrared emission (4) measurements. In several cases, term values for the highest levels in each of the three states were derived with the aid of the only available transition frequencies (4) and these are labeled with doubled asterisks in the table.

### 3. LINE STRENGTHS

The strength,  $S$ , of a water vapor transition at frequency  $\nu$  may be expressed to good approximation by

$$S = C(\nu/Q) (g/T) [1 - \exp(-\nu/kT)] \exp(-E(L)/kT) |R(L,U)|^2$$

where  $C = 8\pi^3/3hc$

$$Q = Q_v \times Q_r$$

$$\text{and } E(L) = E_v(L) + E_r(L) , \quad (1)$$

where  $Q$  is the partition function which can be expressed as the product of the vibrational,  $Q_v$ , and rotational,  $Q_r$ , partition functions,  $g$  is the degeneracy due to the nuclear spin of the lower state level,  $k$  is the Boltzmann constant,  $T$  is the temperature,  $E(L)$  is the lower state energy, and  $R(L,U)$  is the vibration-rotation dipole moment matrix element connecting the lower state,

L, with the upper state, U. Experimental strengths used in this study and obtained from spectra defined in ref. (1) were converted to strength values at 296K using eq. (1) and lower state energies given in ref. (1).

The dipole matrix element, R(L,U), can be expressed as:

$$R(L,U) = \langle J'' K_a'' K_c'' | \langle V'' | \mu | V' \rangle | J' K_a' K_c' \rangle, \quad (2)$$

where  $\mu$  is the dipole moment and prime and double prime denote upper and lower states, respectively. The rotational wavefunction of none interacting states such as the (000) and (010) states, is represented by a linear combination of symmetry adapted wavefunctions:

$$\begin{aligned} |V\rangle |JK_a K_c\rangle &= |V\rangle |\sum_k C(VJK_a K_c K\gamma) JK\gamma\rangle, \\ \text{where } \gamma &= K_a + K_c - J, \\ \text{and } |JK\gamma\rangle &= 2^{-1/2} [ |Jk\rangle + (-1)^k |J-k\rangle ] \\ |J00\rangle &= |J0\rangle. \end{aligned} \quad (3)$$

The  $C(VJK_a K_c K\gamma)$ 's are mixing coefficients which are derived from the solution of the unperturbed Hamiltonian, which, for this study, was represented by the Watson-type (7) Hamiltonian.

Without considering interactions, the vibration-rotation dipole moment element, R(L,U), given in eq. (2), can be expressed as,

$$\begin{aligned} R(L,U) &= \sum_j u(\Delta V, j) x(\Delta V, j) \\ x(\Delta V, j) &= \langle V'' J'' K_a'' K_c'' | A(j) | V' J' K_a' K_c' \rangle, \end{aligned} \quad (4)$$

where the  $u(\Delta V, j)$  are the dipole moment coefficients of the vibrational transition denoted by  $\Delta V$ , and  $A(j)$  are the transformed transition moment operators. The  $x(\Delta V, j)$ 's are the expanded dipole moment matrix elements where  $x(\Delta V, 1)$  is the matrix element of the direction cosines in which  $A(1) = \Phi_\alpha$  with  $\alpha = z$  for A-type transitions and  $\alpha = x$  for B-type transitions.

The rotational wavefunctions of the upper states are linear combinations of the three interacting states. for the (020) and (100) states, the wavefunctions can be given by:

$$\begin{aligned} |V_1 JK_a K_c\rangle &= |V_1\rangle |\Sigma_k C(V_1 V_1 JK_a K_c K\gamma) JK\gamma\rangle \\ &+ |V_2\rangle |\Sigma_k C(V_1 V_2 JK_a K_c K\gamma) JK\gamma\rangle \\ &+ |V_3\rangle |\Sigma_{k'} C(V_1 V_3 JK_a K_c K'\gamma') JK'\gamma'\rangle, \end{aligned} \quad (5)$$

where  $\gamma \neq \gamma'$  and when  $K_a$  and  $K$  are even, then the  $K'$  are odd and when  $K_a$  and  $K$  are odd, the  $K'$  are even.  $V_1$  represents either the (020) or (100) vibrational states and  $V_2$  then represents the (100) or (020) states.  $V_3$  represents the (001) state. The wavefunction of a level for the (001) state,  $V_3$ , can then be expressed by:

$$\begin{aligned} |V_3 JK_a K_c\rangle &= |V_3\rangle |\Sigma_k C(V_3 V_3 JK_a K_c K\gamma) JK\gamma\rangle \\ &+ |V_1\rangle |\Sigma_{k'} C(V_3 V_1 JK_a K_c K'\gamma') JK'\gamma'\rangle \\ &+ |V_2\rangle |\Sigma_{k''} C(V_3 V_2 JK_a K_c K''\gamma'') JK''\gamma''\rangle, \end{aligned} \quad (6)$$

where  $\gamma \neq \gamma'$  and the relationship between  $K_a$  and  $K$  with  $K'$  are given above.

The vibration-rotation dipole moment element,  $R(L,U)$ , for either the (020)-(010) or (100)-(010) bands as well as the (020)-(000) or (100)-(000) bands can be expressed in the same form as eq. (4) as:

$$R(L,U) = \sum_j u(Sf,j)x(Sf,j) + \sum_j u(F,j)x(F,j) + \sum_{j'} u(C,j')x(C,j')$$

$$R(L,U) = s_f R(L,U) + F R(L,U) + C R(L,U), \quad (7)$$

where  $S_f$  means self,  $F$  means Fermi, and  $C$  means Coriolis. The Fermi-type interactions are between the (020) and (100) states and the Coriolis type interactions are between the (020) and (001) states or between the (100) and (001) states.  $R(L,U)$  for the (001)-(010) band takes on a somewhat different form:

$$R(L,U) = \sum_j u(Sf,j)x(Sf,j) + \sum_{j'} u(C1,j')x(C1,j') + \sum_{j'} u(C2,j')x(C2,j')$$

$$R(L,U) = s_f R(L,U) + C1 R(L,U) + C2 R(L,U), \quad (8)$$

where  $C1$  and  $C2$  represent Coriolis-type interactions between the (001) and (100) states and between the (001) and (020) states, respectively.

Returning to the wavfunctions, the mixing coefficients are derived from the solution of the orthogonal H-matrix for the interacting upper states which can be represented by the following:

$$H = \begin{bmatrix} H[Sf]_{11} & H[F]_{12} & H[C]_{13} \\ H[F]_{21} & H[Sf]_{22} & H[C]_{23} \\ H[C]_{31} & H[C]_{32} & H[Sf]_{33} \end{bmatrix} \quad (9)$$

where the elements of the matrix are sub-matrices and the states, 1, 2, and 3, are defined above and Sf, F, and C denote self, Fermi, and Coriolis. The unperturbed lower state coefficients were derived from the solution of the sub-matrix,  $H[Sf]$ . The off diagonal elements of the H-matrix were derived from the expressions:

$$\begin{aligned} \langle JK\gamma | < V_1 | F_{12} | V_2 > | JK\gamma > &= \langle JK\gamma | < V_2 | F_{21} | V_1 > | JK\gamma > \\ &= F_0 + F_k K^2 + F_J (J^2 + J) + 0.5 \delta_{K,1} (-1)^k F_{xy} (J^2 + J) \\ \langle JK\gamma | < V_1 | F_{12} | V_2 > | JK\pm 2\gamma > &= \langle JK\gamma | < V_2 | F_{21} | V_1 > | JK\pm 2\gamma > \\ &= Z_k F_{xy} G(J, K\pm) \\ \langle JK\gamma | < V_n | C_{n3} | V_3 > | JK\pm 1\gamma' > &= \langle JK\pm 1\gamma' | < V_3 | C_{3n} | V_n > | JK\gamma > \\ &= U_k [(J \mp K)(J \pm K + 1)]^{1/2} [\pm C_{y}^{n3} + (2K \pm 1) C_{xz}^{n3}] \\ \text{where } C_{y}^{n3} &= -C_{y}^{3n} \text{ and } C_{xz}^{n3} = C_{xz}^{3n} \text{ and } n=1 \text{ or } 2 \\ \text{and } G(J, K\pm) &= 0.5 [(J \mp K - 1)(J \mp K)(J \pm K + 1)(J \pm K + 2)]^{1/2}, \quad (10) \end{aligned}$$

where the states 1, 2 and 3 were defined above and  $\delta_{K,1}$  is the Kronecker delta symbol in which  $\delta_{1,1} = 1$  and zero for other values of K.  $Z_k = 1$  if  $K \neq 0$  for the upper sign and  $K \neq 2$  for the lower sign whereas  $Z_k = 2^{1/2}$  if  $K=0$  for the upper sign or  $K = 2$  for the lower

sign.  $U_K = 1$  if  $K \neq 0$  for the upper sign and  $K \neq 1$  for the lower sign whereas  $Z_K = 2^{1/2}$  if  $K=0$  for the upper sign or  $K = 1$  for the lower sign and  $\gamma \neq \gamma'$ .

Vibration-rotation frequency parameters obtained in other studies were applied here for the solution of the H-matrix and thus the determination of the rotational wavefunction mixing coefficients of the states. These included the following: the ground state and (010) state parameters of  $H_2^{16}O$  from Toth (8), and those of the (010), (020), and (100) states of  $H_2^{16}O$  from Flaud and Camy-Peyret (9) which include the Fermi- and Coriolis-type interaction parameters expressed in eq. (10).

The expressions for the dipole moment matrix elements,  $x(\Delta V, j)$ , defined in eqs. (4,7,8), and used in the expansion of the dipole moment are given in Tables 2 and 3. The elements for the B-type transitions are given in Table 2 and have been used in previous studies (1,2,3,8). The elements used in this work for A-type transitions are given in Table 3 and consist of the 8 elements (first 8 in Table 3) defined by Flaud and Camy-Peyret (10) plus 6 additional terms. It was determined from a least-squares fitting procedure of newly analyzed line strengths of the (010)-(000) band A-type transitions of  $HD^{16}O$  by this author that the first eight terms did not adequately represent the experimental results. The HDO results will be reported in the near future. The last 6 terms given in Table 3 were empirically determined.

The line strengths were analyzed in terms of two sets of data. One set was comprised of 2334 previously measured line strengths

(2,3) of the (020)-(000), 100)-(000), and (001)-(000) bands. The other set involved 810 selected measurements of the (020)-(010), (100)-(010), and (001)-(010) bands which included previously measured values (2,3) added to the present observed values from which an averaged line strength list was derived. The line strengths for each set were simultaneously least-squares fitted using expressions and methods described in this section. Included in the analyses were values of the lower state energy levels given in ref. (1) and expressions of the dipole moment matrix elements given in Tables 2 and 3.

The results from the least-squares analyses of the strengths are given in Table 4. The upper portion of the table lists the dipole moment expansion coefficients,  $u(j)$ , derived for the ground state bands. Not all of the available line strength values were used in the analysis in order to obtain the most accurate results for  $u(j)$ . The number of lines fitted,  $N$ , were 1257 in which those used from the (020)-(000) and (100)-(000) bands had estimated measured uncertainties,  $\pm s$ , of 4% or less and for the (001)-(000) band,  $\pm s \leq 8\%$ . In an early study, Flaud and Camy-Peyret (10) fitted 240 experimental lines with strengths,  $S > 3.0 \times 10^{-3} \text{ cm}^{-2}/\text{atm}$ . and determined the correct set of relative signs of the dipole moment coefficients,  $u(j)$ , which for the  $u(1)$  terms, was found to be + - + for the (020)-(000), (100)-(000), and (001)-(000) bands, respectively. In the present study, the experimental lines fitted in the ground state analysis had strength values;  $S \geq 2.3 \times 10^{-6} \text{ cm}^{-2}/\text{atm}$ . The standard deviation in percent,  $\sigma\%$ , given below

N in Table 4 for each band set of results were derived from the expression:

$$\sigma\% = \{\sum [(S_{\text{obs}} - S_{\text{cal}})/S_{\text{obs}}]^2/N\}^{1/2} \times 100. \quad (11)$$

Inspection of the ground state results given in Table 4 show that not all of the dipole expansion terms were used in the fit. The terms used were those with uncertainties in the derived coefficients,  $u(j)$ , of equal magnitude or less than the coefficient value and the values for the uncertainties are given within parentheses in the table.

The results obtained from the least-squares fit of the lower frequency set of data are given in the lower portion of Table 4. The analysis of the line strengths of the "hot" bands involved initial guesses as to the relative signs of the leading dipole moment term,  $u(1)$ , of each of the three unperturbed band representations. The most satisfactory results were found when the relative signs of the (100)-(010) and (001)-(010) bands were of the same sign and opposite to that of the (020)-(010) band. This result differs from that obtained by Flaud et al. (11) in which they fitted 60 experimental line strengths in these three bands and found that the relative signs of the leading terms were all the same. The results of these fits are highly sensitive to the experimental line strengths in the (100)-(010) band. They (11) included 11 measured line strengths of the (100)-(010) band in their analysis and the standard-deviation,  $\sigma\%$ , between the measured

and computed strengths for these 11 transitions was 11.1%. All of their experimental strength values were greater than their computed values and larger than the strengths obtained in the present study for these 11 transitions. Using the measured strengths and analysis of the present study,  $\sigma\%$  was found to be 1.8% for the 11 lines. As was the case for the analysis of the ground state bands, the number of lines fitted, N, in the "hot" bands analysis were not all of the lines measured. The strengths of the lines included in the analysis, 546, were measured to good accuracy with estimated uncertainties of  $\pm s \leq 7\%$  for the (020)-(010) and (100)-(010) bands and  $\pm s \leq 8\%$  for the (001)-(010) band.

#### 4. RESULTS

Table 5 is a listing of measurements obtained for the (020)-(010) band. The table gives the observed line positions, the observed minus computed line positions, o-c, the rotational quantum assignments, observed strength, estimated uncertainty in the observed strength,  $\pm s$ , calculated strength and observed minus computed strength, (o-c)%. Lines labeled with an asterisk, \*, before the frequency are doubled absorptions which were not adequately resolved in the spectra and the strength given represents the sum of the strengths of the two comparable transitions. The computed positions were derived from the energy levels given in ref. (1) for the lower state and those given in Table 1 for the upper state. The computed strength, S, of a given transition for the (020)-(010) band can be expressed in a form

following from eqs. (1) and (7) as:

$$S = [\rho(Sf)\sqrt{S(Sf)} + \rho(F)\sqrt{S(F)} + \rho(C)\sqrt{S(C)}]^2$$

$$S = [Z(020) + Z(100) + Z(001)]^2$$

$$\text{where } \rho(n) = {}^nR(L,U) / |{}^nR(L,U)| \quad n=Sf \text{ or } F \text{ or } C, \quad (12)$$

where  $(Sf)$ ,  $(F)$ , and  $(C)$  pertains to self, Fermi, and Coriolis, respectively and  ${}^nR(L,U)$  is the dipole moment matrix element due to the type of interaction  $n$ .  $Z(100)$ , and  $Z(001)$  are the contributions to the strength due to Fermi and Coriolis-type interactions and  $Z(020)^2$  represents the unperturbed strength.

\*Values of the calculated strengths and the  $Z()$ 's (also listed in Table 5) were computed from eq. (1), the dipole moment matrix elements given in Table 4 which were used along with derived wavefunction mixing coefficients to obtain values of  $|R(L,U)|$ , and the lower state energies given in ref. (1).

Tables 6 -10 are listings for the measurements and computed values of the  $(100)-(010)$ ,  $(001)-(010)$ ,  $(020)-(000)$ ,  $(100)-(000)$ , and  $(001)-(000)$  bands, respectively, given in forms similar to that of Table 5. Values of the  $Z()$ 's of the  $(020)-(000)$ ,  $(100)-(010)$ , and  $(100)-(000)$  bands given in Tables 8, 6, and 9, respectively, are expressed in terms of the  $Z()$ 's as shown in eq. (12) with  $(100)$  replacing  $(020)$  for the  $Z()$  expressions of the  $(100)$  upper state bands. The  $Z()$ 's given in Tables 7 and 10 for the  $(001)-(010)$  and  $(001)-(000)$  bands, respectively, were derived from expressions differing a little from those given in eq. (12):

$$S = [\rho(S_f)\sqrt{S(S_f)} + \rho(C_1)\sqrt{S(C_1)} + \rho(C_2)\sqrt{S(C_2)}]^2$$

$$S = [Z(001) + Z(100) + Z(020)]^2$$

$$\text{where } \rho(n) = {}^nR(L, U) / |{}^nR(L, U)| \quad n=S_f \text{ or } C_1 \text{ or } C_2, \quad (13)$$

where  $(C_1)$  and  $(C_2)$  represent Coriolis-type interactions due to the  $(100)$  and  $(020)$  states, respectively.

The computed line strength values given in Tables 5-10 for the six bands are, overall, an improvement over the values given in the HITRAN compilation (12). However the values given here are suspect for several transitions. These include several lines located in the high frequency region of the  $(100)-(000)$  band and various transitions of the  $(100)-(010)$ ,  $(001)-(010)$ , and  $(020)-(000)$  bands with strongly perturbed line strengths.

## 5. CONCLUSION

This work involves measurements and analysis of line positions and strengths of 810 lines of the  $(020)-(010)$ ,  $(100)-(010)$ , and  $(001)-(010)$  bands and 2334 lines of the  $(020)-(000)$ ,  $(100)-(000)$ , and  $(001)-(000)$  bands. This large data set included measurements from previous studies by this author (2,3). The line positions analyzed also included measurements from other reports (4-6) to determine rotational energy levels of the  $(020)$ ,  $(100)$ , and  $(001)$  vibrational states of  $H_2^{16}O$ . The results were weighted and averaged for each level with the highest weight given to the few available microwave (6) measurements. Frequencies from the far-infrared emission study reported by Polyansky et al.(4) were only used in

the analysis when necessary because , for several transition frequencies in the (000)-(000) and (010)-(000) bands, their reported values were found to be  $4.5 \times 10^{-4} \text{ cm}^{-1}$  higher, on the average, than those given in my recent study (1) with an uncertainty of  $\pm 3.2 \times 10^{-4} \text{ cm}^{-1}$ .

The measured line strengths of 546 transitions of the (020)-(010), (100)-(010), and (001)-(010) bands of  $\text{H}_2^{16}\text{O}$  were least-squares fitted simultaneously using a quantum mechanical model first proposed and used by Flaud and Camy-Peyret (10). The same method was used to fit 1257 experimental line strengths of the (020)-(000), (100)-(000), and (001)-(000) bands. The model is based upon wave functions composed of symmetry-adapted rotational wave functions with mixing coefficients derived from the energy wave equation including Fermi-type and Coriolis-type interaction terms. The dipole moments of the bands in their respective unperturbed representations are expressed as series expansions in which the original theory (10) contained 8 expansion coefficients for both B-type and A-type bands. In this work and my earlier studies (1,2,3,8), 19 expansion coefficients were used in fits of B-type transitions whereas the A-type transitions contained six more than the original (10) number of terms (14 terms).

The results of the least-squares fit of the "hot" bands data involved initial guesses as to the relative signs of the leading dipole moment term,  $u(1)$ , of each of the three unperturbed band representations. The most satisfactory results were found when the relative signs of the (100)-(010) and (001)-(010) bands were of the

same sign and opposite to that of the (020)-(010) band. This result differs from that obtained by Flaud et al. (11) in which they fitted 60 experimental line strengths in these three bands and found that the relative signs of the leading terms were all the same. The results of these fits are highly sensitive to the experimental line strengths in the (100)-(010) band. The analysis of the ground state bands were aided with prior knowledge of the relative signs of the  $u(1)$ 's due to the early work on these bands by Flaud and Camy-Peyret (10).

The computed line strength values presented in this study are an improvement over the values given in the HITRAN compilation (12). However several values obtained in this work may be inaccurate and these include the high frequency region of the (100)-(000) band and various lines with highly perturbed strengths of the (100)-(010), (001)-(010), and (020)-(000) bands.

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Table 1. Energy levels of H<sub>2</sub><sup>16</sup>O in the (001), (100), and (020) states<sup>a</sup>

J	K <sub>a</sub>	K <sub>c</sub>	-----(001)----	-----(100)----	-----(20)----	J	K <sub>a</sub>	K <sub>c</sub>	-----(001)----	-----(100)----	-----(20)----						
0	0	0	3755.92868	3.	3657.05323	4.	3151.63007	8.	8	4	5	4851.53777	13.	4756.39404	4.	4381.73526	7.
1	0	1	3779.49307	5.	3680.45355	6.	3175.44132	3.	8	4	4	4861.80322	8.	4769.03852	7.	4386.31305	6.
1	1	1	3791.70090	2.	3693.29348	5.	3196.09333	2.	8	5	4	4976.04330	6.	4889.45707	8.	4564.03471	6.
1	1	0	3796.98160	5.	3698.49117	6.	3201.91343	3.	8	5	3	4977.04413	6.	4889.40405	4.	4564.36666	5.
2	0	2	3825.21298	6.	3725.94197	3.	3221.96117	2.	8	6	3	5122.34755	15.	5039.62740	15.	4774.80475	5.
2	1	2	3833.57663	3.	3734.89675	20.	3237.91735	4.	8	6	2	5122.39294	15.	5039.64212	7.	4775.08812	9.
2	1	1	3849.38533	4.	3750.46434	4.	3255.34595	4.	8	7	2	5289.95805	20.	5213.26938	15.	5008.96270	8.
2	2	1	3885.73775	6.	3788.69435	7.	3316.14534	4.	8	7	1	5289.95898	15.	5213.26885	6.	5008.96275	10.
2	2	0	3887.11416	3.	3789.96940	5.	3317.21064	5.	8	8	1	5475.75540	60.	5406.54914	20.	5261.47110	25.
3	0	3	3890.82934	7.	3791.37207	6.	3289.24253	3.	8	8	0	5475.75540	60.	5406.54914	20.	5261.47110	25.
3	1	3	3895.58800	2.	3796.53970	4.	3299.99106	5.	9	0	9	4661.42650	10.	4559.70763	4.	4068.70368	4.
3	1	2	3926.86209	7.	3827.39264	2.	3334.62654	3.	9	1	9	4661.44856	7.	4559.75210	8.	4068.93093	4.
3	2	2	3956.66578	7.	3858.87558	4.	3387.68065	5.	9	1	8	4816.99088	7.	4715.96693	5.	4263.15032	4.
3	2	1	3962.91780	3.	3864.76373	5.	3392.74934	4.	9	2	8	4817.73572	7.	4717.10443	7.	4268.24075	4.
3	3	1	4030.06989	6.	3935.21125	8.	3500.51110	4.	9	2	7	4939.79427	4.	4837.69963	6.	4399.54208	3.
3	3	0	4030.30616	4.	3935.34470	4.	3500.63869	5.	9	3	7	4949.00295	7.	4850.44135	5.	4436.94025	8.
4	0	4	3974.63090	5.	3875.01704	6.	3375.29782	7.	9	3	6	5022.28122	8.	4918.23478	9.	4493.80420	5.
4	1	4	3977.26146	3.	3877.57516	5.	3381.70424	4.	9	4	6	5067.07666	5.	4971.26073	4.	4600.49724	5.
4	1	3	4027.80399	3.	3927.80275	12.	3438.57499	5.	9	4	5	5087.01711	4.	4992.12155	12.	4611.79473	7.
4	2	3	4050.05215	4.	3951.31505	4.	3482.06447	4.	9	5	5	5193.45765	6.	5108.34934	5.	4783.64080	10.
4	2	2	4066.12251	2.	3966.55931	7.	3495.93919	5.	9	5	4	5196.50047	6.	5107.72911	5.	4784.66203	8.
4	3	2	4125.14862	6.	4030.83892	6.	3597.86602	4.	9	6	4	5339.64133	5.	5256.38144	5.	4994.70250	50.
4	3	1	4126.46336	4.	4031.85358	4.	3598.72702	4.	9	6	3	5339.84331	5.	5256.44870	8.	4996.33142	6.
4	4	1	4224.81686	5.	4135.01762	3.	3746.76262	4.	9	7	3	5507.47495	7.	5430.18080	15.	5229.57670	15.
4	4	0	4224.85097	8.	4134.79845	6.	3746.77595	4.	9	7	2	5507.48233	15.	5430.18368	4.	5229.57880	15.
5	0	5	4076.14328	4.	3976.30807	5.	3478.98647	3.	9	8	2	5694.04805	10.	5624.38708	20.	5483.32300	15.
5	1	5	4076.89581	3.	3977.45645	6.	3482.48019	5.	9	8	1	5694.04805	10.	5624.38708	5.	5483.32300	15.
5	1	4	4149.89926	4.	4049.53611	7.	3565.45461	3.	9	9	1	5896.27242	20.	5836.98570	10.	5749.91820**	60.
5	2	4	4165.47381	6.	4065.13186	6.	3598.51596	5.	9	9	0	5896.27242	20.	5836.98570	10.	5749.91820**	60.
5	2	3	4195.97092	4.	4095.91994	6.	3626.92216	3.	10	0	10	4852.74891	15.	4750.36213	3.	4260.35172	4.
5	3	3	4244.30465	3.	4150.28736	6.	3719.49286	4.	10	1	10	4852.75520	6.	4750.38769	5.	4260.46683	4.
5	3	2	4248.15245	4.	4153.93806	4.	3722.73098	5.	10	1	9	5027.25667	7.	4925.78690	7.	4480.39219	6.
5	4	2	4345.27202	7.	4257.78674	5.	3868.87286	4.	10	2	9	5027.55957	10.	4926.34685	4.	4483.22783	5.
5	4	1	4345.55907	6.	4256.24129	5.	3868.98687	4.	10	2	8	5171.05989	9.	5069.08831	3.	4644.21691	5.
5	5	1	4468.69325	8.	4381.90416	7.	4050.50370	6.	10	3	8	5175.95513	5.	5076.26603	4.	4669.73577	6.
5	5	0	4468.69775	9.	4381.90399	3.	4050.51272	8.	10	3	7	5273.63258	5.	5169.03929	6.	4752.73291	9.
6	0	6	4195.47720	3.	4095.31530	7.	3600.05235	4.	10	4	7	5304.72758	6.	5207.80205	5.	4842.13125	7.
6	1	6	4195.81803	4.	4095.80318	6.	3601.85888	3.	10	4	6	5355.26288	10.	5246.80025	7.	4864.37335	10.
6	1	5	4290.75699	5.	4190.26211	9.	3713.08244	4.	10	5	6	5434.48392	7.	5334.98829	5.	5027.07398	7.
6	2	5	4296.56345	4.	4199.39098	5.	3736.17076	5.	10	5	5	5442.09777	5.	5351.40865	5.	5029.81045	15.
6	2	4	4350.69931	3.	4249.52442	5.	3784.67911	5.	10	6	5	5580.81831	6.	5496.98054	7.	5238.38525	30.
6	3	4	4387.23468	3.	4292.90990	6.	3864.96604	3.	10	6	4	5581.52478	5.	5497.21532	5.	5237.42018	10.
6	3	3	4408.02880	4.	4308.21129	6.	3873.79365	4.	10	7	4	5748.66140	10.	5670.61532	5.	5473.80280	50.
6	4	3	4490.06387	5.	4394.46433	3.	4015.51500	5.	10	7	3	5748.69841	6.	5670.62990	25.	5473.81150	100.
6	4	2	4491.36973	10.	4401.94198	6.	4016.05274	5.	10	8	3	5935.83130	15.	5865.60400	20.	5728.66080**	5.
6	5	2	4613.52635	4.	4526.72016	10.	4197.33874	4.	10	8	2	5935.83220	10.	5865.60490	30.	5728.66080**	5.
6	5	1	4613.57320	9.	4526.72048	6.	4197.36095	6.	10	9	2	6139.32374	25.	6079.97800	15.	5996.63750**	15.
6	6	1	4759.85260	5.	4677.87640	15.	4407.04635	8.	10	9	1	6139.32374	25.	6079.97800	15.	5994.63750**	15.
6	6	0	4759.85320	15.	4677.87638	7.	4407.15763	7.	10	10	1	6355.73662	70.	6264.74570	10.	6318.91737**	200.
7	0	7	4332.77377	8.	4232.18448	3.	3738.60907	4.	10	10	0	6355.73662	70.	6264.74570	10.	6318.91737**	200.
7	1	7	4332.91224	4.	4232.38427	6.	3739.51875	3.	11	0	11	5062.01060	20.	4958.90120	5.	4469.73720	7.
7	1	6	4448.97069	5.	4348.41466	3.	3879.33617	4.	11	1	11	5062.01305	35.	4958.93670	7.	4469.79640	6.
7	2	6	4452.35271	6.	4353.23138	8.	3894.16768	4.	11	1	10	5255.20533	7.	5153.18846	3.	4714.81866	5.
7	2	5	4527.94931	7.	4426.06633	8.	3967.48843	5.	11	2	10	5255.34660	25.	5153.53450	25.	4716.37920	7.
7	3	5	4553.27350	4.	4457.81869	7.	4033.61446	5.	11	2	9	5418.80341	8.	5316.80421	7.	4905.65342	6.
7	3	4	4586.68325	4.	4484.99211	6.	4052.83686	5.	11	3	9	5421.26757	5.	5320.88903	5.	4922.08975	15.
7	4	4	4658.97471	5.	4563.98965	3.	4186.56940	8.	11	3	8	5543.63668	15.	5439.05643	5.	5034.38715	20.
7	4	3	4663.15065	8.	4572.44629	3.	4188.39425	4.	11	4	8	5563.39973	11.	5465.05348	10.	5105.72968	7.
7	5	3	4782.66210	6.	4695.83638	10.	4368.54589	4.	11	4	7	5631.83930	5.	5524.56922	15.	5144.40888	15.
7	5	2	4782.92004	10.	4695.83625	4.	4368.63692	6.	11	5	7	5698.48945	8.	5601.53139	10.	5293.79055	20.
7	6	2	4929.06164	8.	4846.77361	4.	4578.88225	7.	11	5	6	5714.53190	10.	5621.33438	10.	5300.17804	7.
7	6	1	4929.06900	25.	4846.77595	10.	4578.97792	6.	11	6	6	5845.65325	15.	5761.40248	10.	5505.62285**	10.
7	7	1	5096.24520	10.	5020.02609	10.	4812.19276	5.	11	6	5	5847.70666	20.	5762.06029	15.	5505.17354	10.
7	7	0	5096.24564	30.	5020.02626	10.	4812.19276	5.	11	7	5	6013.36593	7.	5934.41938	15.	5741.39112**	15.
8	0	8	4488.09049	7.	4387.35723												

Table 1. continued

J	K <sub>a</sub>	K <sub>c</sub>	----(001)----	----(100)----	----(020)----	J	K <sub>a</sub>	K <sub>c</sub>	----(001)----	----(100)----	----(020)----	
11	11	1	6852.16690*	20.	6785.59920* 100.	14	8	6	7133.78060* 55.			
11	11	0	6852.16690*	20.	6785.59920* 100.	14	9	6	7340.18604**200.			
12	0	12	5289.15190	40.	5186.33728 9.	4696.83412	7.	14	9	5	7340.20593**200.	
12	1	12	5289.15275	15.	5184.73422	7.	4696.86530	4.	14	10	5	7562.67563**300.
12	1	11	5500.85650	9.	5398.25055	40.	4966.63330	15.	14	10	4	7562.67563**300.
12	2	11	5500.91555	25.	5399.33075	50.	4967.49060	9.	14	11	4	7797.54254**200.
12	2	10	5683.33260	7.	5581.10944	15.	5182.09488	6.	14	11	3	7797.54254**200.
12	3	10	5684.53040	10.	5579.48959	20.	5193.88195	7.	14	12	3	8041.60937**300.
12	3	9	5830.25928	7.	5726.06227	15.	5336.32705** 10.		14	12	2	8041.60937**300.
12	4	9	5841.86277	7.	5742.03689	25.	5389.55216	7.	15	0	15	6077.10440
12	4	8	5933.54645	5.	5826.13424	15.	5450.88876** 10.		15	1	15	6077.10440
12	5	8	5984.67529	8.	5887.76575	15.	5587.51845	20.	15	1	14	6343.43370
12	5	7	6013.44786	5.	5918.17380	60.	5596.42458** 25.		15	2	14	6342.52743
12	6	7	6133.77440	25.	6049.84869	4.	5796.12947** 20.		15	2	13	6578.87000
12	6	6	6138.88956	40.	6051.27285	20.	5796.45325** 20.		15	3	13	6579.74013
12	7	6	6301.40727	5.	6221.43140	10.	6032.08052** 25.		15	3	12	6784.70473
12	7	5	6301.87331	15.	6221.62318	20.	6032.19848** 10.		15	4	12	6786.68808
12	8	5	6489.01100	20.	6417.29610	10.	6288.55000** 35.		15	4	11	6952.18900
12	8	4	6489.03900	50.	6417.30500	50.	6288.55000** 35.		15	5	11	6966.58370
12	9	4	6694.57874	100.	6635.10920	20.	6558.75148** 8.		15	5	10	7074.36088**200.
12	9	3	6694.57874	100.	6635.10920	20.	6558.75148** 8.		15	6	10	7131.63000* 50.
12	10	3	6914.35740*	20.	6825.89900*	80.	6882.94805**200.		15	6	9	7167.33755**200.
12	10	2	6914.35740*	20.	6825.89900*	80.	6882.94805**200.		15	7	9	7302.71880*
12	11	2	7145.10817**200.		7077.57810**300.				15	7	8	7309.47138**200.
12	11	1	7145.10817**200.		7077.57810**300.				15	8	8	7489.30560* 80.
12	12	1	7383.68026**200.		7328.06878**300.				15	8	7	7490.10810**300.
12	12	0	7383.68026**200.		7328.06878**300.				15	9	7	7696.16420** 50.
13	0	13	5534.11120	30.	5429.11839	10.	4941.60583	10.	15	9	6	7696.22869**200.
13	1	13	5534.11085	20.	5429.12800	10.	4941.62240	10.	15	10	6	7919.65761**300.
13	1	12	5764.18531	20.	5662.47543	50.	5235.95842	5.	15	10	5	7919.66130**300.
13	2	12	5764.20434	15.	5660.40398	20.	5236.43147** 17.		16	0	16	6375.04860
13	2	11	5964.91267	10.	5862.33888	10.	5477.00573	7.	16	1	16	6375.04860
13	3	11	5965.47490	8.	5862.46681	10.	5483.12450** 25.		16	1	15	6659.44740
13	3	10	6132.64413	6.	6028.85845	25.	5654.76088	15.	16	2	15	6659.44740
13	4	10	6139.02953	10.	6037.87366	50.	5695.88298** 18.		16	2	14	6912.56670
13	4	9	6256.02108	9.	6148.68261**100.		5781.95827** 20.		16	3	14	6913.06400
13	5	9	6292.11953	15.	6194.30360*	70.	5896.77300** 30.		16	3	13	7135.32070*
13	5	8	6336.03630	20.	6241.53000*	50.	5919.00850** 25.		16	4	13	7136.38722
13	6	8	6444.63535	9.	6363.56800	25.	6109.52750** 30.		16	4	12	7323.10970*
13	6	7	6455.74210	15.	6365.37931	10.	6111.46746** 8.		16	5	12	7331.47646
13	7	7	6612.54828	10.	6531.47853	20.	6345.58710** 35.		16	5	11	7464.48500** 50.
13	7	6	6613.83527	15.	6532.02020*	20.	6345.92465** 25.		16	6	11	7506.05500
13	8	6	6799.95707	8.	6727.31853	50.	6602.46925**200.		16	6	10	7559.39020*
13	8	5	6800.05500	40.	6727.35817	50.	6602.46085** 40.		16	7	10	7680.81435** 30.
13	9	5	7006.22785**200.		6946.69950*	150.	6873.41155**110.		16	7	9	7694.02710** 60.
13	9	4	7006.23474**200.		6946.70200*	150.	6873.41155**110.		16	8	8	7869.03497**200.
13	10	4	7227.46542	80.	7139.58946**200.				16	9	8	8073.87105**400.
13	10	3	7227.46542	80.	7139.58946**200.				16	9	7	8074.05614**300.
13	11	3	7460.35715**200.		7391.67454**300.				17	0	17	6690.46935
13	11	2	7460.35715**200.		7391.67454**300.				17	1	17	6690.46935
13	12	2	7701.74334**300.		7644.44298**400.				17	1	16	6992.76200
13	12	1	7701.74334**300.		7644.44298**400.				17	2	16	6992.76165
13	13	1	7948.49703**300.						17	2	15	7262.79934
13	13	0	7948.49703**300.						17	3	15	7262.77840** 80.
14	0	14	5796.94253	10.	5690.87824	50.	5204.00840	30.	17	4	14	7503.07200*
14	1	14	5796.88640	30.	5690.87973	40.	5204.01810	30.	17	4	13	7708.95861**300.
14	1	13	6045.17183	15.	5940.54241	100.	5522.85303*	10.	17	5	13	7713.75300**110.
14	2	13	6045.14240	10.	5940.63735	25.	5523.11703** 12.		17	5	12	7871.7369**1000.
14	2	12	6263.69902	15.	6161.13309	100.	5783.85240** 10.		17	6	12	7899.80650
14	3	12	6263.92000	35.	6160.37270	50.	5790.43237** 15.		18	0	18	7023.28230
14	3	11	6451.08135	20.			5993.20197**300.		18	1	18	7023.28230
14	4	11	6454.13385	15.	6351.85500	10.	6019.83165** 30.		18	1	17	7343.34010
14	4	10	6596.22223	10.	6489.62095**200.		6134.91700** 80.		18	2	17	7343.34010
14	5	10	6619.78890	15.	6520.60685	25.	6229.89419** 20.		18	2	16	7630.00767**300.
14	5	9	6705.59380	25.			6267.88500**100.		18	3	16	7630.00767**600.
14	6	9	6777.52810	20.	6676.46965	7.	6445.08355** 50.		18	3	15	7885.92741**300.
14	6	8	6798.71916	30.	6705.04580*	40.	6450.41532**200.		18	4	15	7885.79602**300.
14	7	8	6946.46365*	130.	6864.39485*	30.	6681.59229**200.		19	0	19	7373.38905
14	7	7	6949.58000	20.	6865.72740*	30.	6682.45764**200.		19	1	19	7373.38905
14	8	7	7133.48150*	70.	7059.81100*	150.			19	3	17	8014.10625**200.

a. The uncertainties of the levels are in cm<sup>-1</sup> × 10<sup>-3</sup>

\* Energy level in this work was derived from observed frequencie(s) measured in this work and also from Polyansky et al. refs 4,5

\*\* Energy level given in this work was derived from measured frequencie(s) given by Polyansky et al. refs 4,5

**Table 2. Matrix elements used in the expansion of the dipole moment for B-type transitions of water vapor.**

j	n	$\langle J \ K   A' (j)   J' K' \rangle / \langle J \ K   \Phi(x)   J' K + \Delta K \rangle$	$\Delta K = \pm 1$
2	1	$J' (J'+1) + J(J+1)$	
3	1	$K'^2 + K^2$	
4	1	$K'^2 - K^2$	
5	1	$K'^2 - K^2 - 2m$	
6	1	$(K'^2 - K^2) (K'^2 - K^2 - 2m)$	
7	1	$J(J+1) - 2m(m-1) + (2m-1)K\Delta K - K^2 - 1$	
8	3	$[(J' - K\Delta K - 1) (J' - K\Delta K - 2) (J' + K\Delta K + 2) (J' + K\Delta K + 3)]^{1/2}$	
9	1	$K'^2 J' (J'+1) - K^2 J(J+1)$	
10	1	$K'^4 - K^4$	
11	1	$(K'^2 - K^2) [J' (J'+1) + J(J+1)]$	
12	1	$K'^2 (J'^2 + J')^2$	
13	1	$K'^6$	
14	1	$K'^4$	
15	1	$K'^2 J' (J'+1)$	
16	1	$K'^6 - K^6$	
17	1	$J' (J'+1) \text{ if } m=0 \text{ and } J=K_c \text{ or } J'=K'_c, \text{ otherwise } = 0$	
18	1	$J' (J'+1) \text{ if } m=0 \text{ and } J=K_c \text{ or } J'=K'_c - 1, \text{ otherwise } = 0$	
19	1	$J' (J'+1) \text{ if } m \neq 0 \text{ and } J=K_c \text{ and } J'=K'_c, \text{ otherwise } = 0$	

$$J' - J = 0, \pm 1$$

$$m = [J' (J'+1) - J(J+1)]/2$$

$$K' - K = n\Delta K$$

Table 3. Matrix elements used in the expansion of the dipole moment for A-type transitions of water vapor.

j	n	$\langle J \ K   A' (j)   J' K' \rangle / \langle J \ K   \Phi(z)   J' K' \rangle$	$\Delta K = \pm 1$
2	0	$J' (J'+1) + J(J+1)$	
3	0	$2K^2$	
4	0	m	
5	0	$2J(J+1) - 2m(m-1) - 2K^2 - 1$	
6	2	$\Delta K [(J' - K\Delta K - 1) (J' + K\Delta K + 2)]^* \times F$	
7	2	$2(K + \Delta K) [(J' - K\Delta K - 1) (J' + K\Delta K + 2)]^* \times F$	
8	2	$2\{K + \Delta K(1-m)\} [(J' - K\Delta K - 1) (J' + K\Delta K + 2)]^* \times F$	
9	2	$(K + \Delta K) [K'^2 - K^2] \times F$	
10	2	$(K + \Delta K) [K'^4 - K^4] \times F$	
11	1	$mK'^2$	
12	1	$2K'^2 [J' (J'+1) + J(J+1)]$	
13	1	$K'^4$	
14	1	$K'^6$	

$$J' - J = 0, \pm 1$$

$$m = [J' (J'+1) - J(J+1)]/2$$

$$K' - K = n\Delta K$$

$$F = \langle J \ K | \Phi(z) | J' K' \rangle / \langle J \ K | \Phi(x) | J' K + \Delta K \rangle$$

**Table 5. Observed and computed line strengths (cm<sup>-2</sup>/atm. at 296K) of the (020)-(010) band of H<sub>2</sub><sup>16</sup>O**

observed frequency	o-c	upper J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	#s	computed strength	(o-c)%	Z(020)	Z(100)	Z(001)
995.97779	46.	9	0	9	10	3	8	1.09E-06	15.	1.08E-06	.8	-1.02E-03	-1.50E-05	-3.58E-07
1029.72001	28.	6	1	6	7	4	3	4.30E-07	15.	4.89E-07	-13.7	-6.85E-04	-1.42E-05	-6.37E-08
1038.60255	-120.	9	1	8	10	4	7	1.22E-06	14.	9.96E-07	18.4	-9.80E-04	-1.71E-05	-3.42E-07
1076.85509	28.	8	1	8	9	2	7	4.16E-06	15.	4.27E-06	-2.6	2.03E-03	3.04E-05	6.53E-07
1143.70556	-29.	7	1	7	8	2	6	5.03E-06	15.	4.59E-06	8.7	2.11E-03	3.26E-05	5.93E-07
1160.09800	7.	6	0	6	7	3	5	7.80E-06	10.	6.46E-06	17.2	-2.50E-03	-4.11E-05	-5.46E-07
1167.06322	28.	8	2	7	9	3	6	1.12E-05	5.	1.10E-05	2.0	3.26E-03	5.54E-05	1.05E-06
1167.07295	-20.	5	1	4	6	4	3	5.80E-06	8.	6.18E-06	-6.5	-2.44E-03	-4.80E-05	-2.59E-07
1183.20378	151.	9	3	7	10	4	6	1.44E-06	15.	1.73E-06	-19.9	1.29E-03	2.49E-05	4.57E-07
1205.02649	-87.	3	1	2	4	4	1	1.21E-06	12.	1.30E-06	-7.7	-1.12E-03	-2.34E-05	0.00E+00
1207.27432	6.	5	0	5	6	3	4	3.58E-05	3.	3.46E-05	3.5	-5.78E-03	-9.81E-05	-9.58E-07
1209.26638	2.	6	1	6	7	2	5	4.39E-05	3.	4.31E-05	1.9	6.46E-03	1.03E-04	1.52E-06
1218.63679	-45.	9	5	5	10	6	4	9.06E-07	5.	1.02E-06	-12.4	9.80E-04	2.86E-05	2.87E-07
1219.95728	29.	9	5	4	10	6	5	3.32E-06	6.	3.10E-06	6.6	1.71E-03	4.86E-05	5.16E-07
1223.37828	20.	7	2	6	8	3	5	1.38E-05	2.	1.42E-05	-2.8	3.70E-03	6.50E-05	9.96E-07
1225.61900	-106.	9	6	3	10	7	4	9.25E-07	6.	7.75E-07	16.3	8.67E-04	1.33E-05	2.16E-07
1225.82076	67.	8	3	6	9	4	5	2.11E-05	2.	2.12E-05	-.6	4.52E-03	8.97E-05	1.34E-06
1228.52898	-33.	9	4	5	10	5	6	6.50E-06	4.	5.70E-06	12.3	2.33E-03	5.44E-05	7.41E-07
1240.68930	2.	8	4	5	9	5	4	2.10E-05	2.	1.88E-05	10.7	4.23E-03	9.93E-05	1.14E-06
1243.02141	4.	8	5	4	9	6	3	1.07E-05	5.	1.04E-05	2.8	3.13E-03	9.15E-05	7.35E-07
1243.43697	9.	8	5	3	9	6	4	3.76E-06	6.	3.46E-06	7.9	1.81E-03	5.22E-05	4.27E-07
1248.17731	1.	8	6	3	9	7	2	4.50E-06	6.	4.49E-06	-.2	2.04E-03	7.47E-05	3.90E-07
1248.88997	-17.	4	0	4	5	3	3	1.55E-05	4.	1.47E-05	5.1	-3.77E-03	-6.57E-05	-4.14E-07
1261.92426	-8.	7	3	5	8	4	4	2.38E-05	3.	2.44E-05	-2.4	4.84E-03	9.78E-05	1.15E-06
1263.50881	56.	11	3	8	12	4	9	7.49E-07	15.	6.39E-07	14.7	7.80E-04	1.88E-05	2.13E-07
1266.43747	7.	7	4	4	8	5	3	1.79E-05	4.	1.88E-05	-4.8	4.23E-03	1.00E-04	8.82E-07
1267.40385	12.	7	5	3	8	6	2	9.60E-06	5.	1.01E-05	-5.6	3.09E-03	9.13E-05	5.11E-07
1267.51330	20.	7	5	2	8	6	3	2.92E-05	4.	3.04E-05	-4.2	5.36E-03	1.57E-04	8.82E-07
1268.76157	24.	7	4	3	8	5	4	5.60E-05	2.	5.67E-05	-1.3	7.36E-03	1.75E-04	1.52E-06
1269.25794	31.	9	3	6	10	4	7	7.82E-06	10.	8.50E-06	-8.7	2.85E-03	6.16E-05	7.94E-07
1271.28972	12.	5	1	5	6	2	4	4.28E-05	2.	4.34E-05	-1.4	6.48E-03	1.07E-04	1.20E-06
1272.58684	11.	7	6	2	8	7	1	3.95E-06	6.	4.41E-06	-11.7	2.02E-03	7.75E-05	2.28E-07
1272.68300	24.	7	6	1	8	7	2	1.30E-05	20.	1.33E-05	-2.3	3.51E-03	1.39E-04	3.82E-07
1273.29570	20.	6	2	5	7	3	4	1.42E-04	2.	1.48E-04	-4.4	1.20E-02	2.16E-04	2.52E-06
1275.73443	62.	7	0	7	7	3	4	3.81E-06	4.	4.21E-06	-10.5	2.01E-03	3.99E-05	-7.45E-07
1276.55330	-6.	8	3	5	9	4	6	8.55E-06	10.	9.28E-06	-8.6	2.98E-03	6.28E-05	7.57E-07
1284.42668	-18.	3	0	3	4	3	2	3.80E-05	2.	3.45E-05	9.2	-5.77E-03	-1.03E-04	-2.91E-07
1286.12105	36.	13	0	13	14	1	14	2.37E-06	10.	2.08E-06	12.3	1.41E-03	2.72E-05	1.88E-08
1287.55763	66.	13	0	13	13	1	12	1.71E-06	15.	1.45E-06	15.4	-1.19E-03	-1.53E-05	5.31E-08
1288.13974	30.	7	3	4	8	4	5	7.50E-05	15.	8.24E-05	-9.8	8.89E-03	1.05E-04	1.93E-06
1291.14691	-93.	8	1	7	8	4	4	8.55E-07	15.	9.04E-07	-5.7	9.30E-04	2.12E-05	-4.11E-07
1291.34810	19.	6	4	3	7	5	2	1.47E-04	2.	1.48E-04	-.6	1.19E-02	2.86E-04	1.71E-06
1291.90551	23.	6	5	2	7	6	1	8.15E-05	2.	7.90E-05	3.0	8.63E-03	2.59E-04	7.54E-07
1291.93048	13.	6	5	1	7	6	2	2.66E-05	2.	2.63E-05	1.1	4.98E-03	1.49E-04	4.38E-07
1292.01148	16.	6	4	2	7	5	3	4.88E-05	2.	4.94E-05	-1.3	6.86E-03	1.66E-04	9.84E-07
1292.82678	-11.	6	3	4	7	4	3	2.06E-04	4.	2.08E-04	-1.2	1.41E-02	2.91E-04	2.53E-06
1297.13486	12.	6	6	1	7	7	0	3.36E-05	3.	3.13E-05	7.0	5.39E-03	1.95E-04	3.61E-07
1297.24643	30.	6	6	0	7	7	1	1.29E-05	3.	1.16E-05	10.5	3.27E-03	1.28E-04	-1.44E-08
1304.28589	18.	6	3	3	7	4	4	7.14E-05	2.	7.27E-05	-1.8	8.35E-03	1.73E-04	1.43E-06
1305.70363	17.	12	0	12	13	1	13	2.43E-06	4.	2.36E-06	2.9	1.51E-03	2.92E-05	1.85E-08
1305.73930	16.	12	1	12	13	0	13	6.50E-06	8.	7.08E-06	-8.9	-2.61E-03	-5.07E-05	-3.15E-08
1307.19695	-7.	7	1	6	7	4	3	5.36E-06	4.	5.30E-06	1.2	2.25E-03	5.04E-05	-9.34E-07
1310.78224	46.	12	0	12	12	1	11	1.78E-06	4.	1.61E-06	9.4	-1.25E-03	-1.69E-05	5.53E-08
1313.91663	-36.	6	1	5	6	4	2	2.44E-06	9.	2.06E-06	15.7	1.40E-03	3.13E-05	-5.77E-07
1314.51000	21.	2	0	2	3	3	1	4.42E-06	8.	4.15E-06	6.2	-2.00E-03	-3.63E-05	0.00E+00
1315.92640	0.	5	2	4	6	3	3	1.41E-04	2.	1.46E-04	-3.8	1.19E-02	2.20E-04	1.82E-06
1315.99327	9.	5	4	2	6	5	1	1.14E-04	1.	1.14E-04	-.4	1.04E-02	2.55E-04	7.92E-07
1316.12975	11.	5	4	1	6	5	2	3.30E-04	4.	3.42E-04	-3.7	1.81E-02	4.42E-04	1.37E-06
1316.54098	20.	5	5	1	6	6	0	5.90E-05	3.	6.11E-05	-3.5	7.58E-03	2.31E-04	5.70E-08
1316.54994	-10.	5	5	0	6	6	1	1.83E-04	2.	1.82E-04	-.8	1.31E-02	3.96E-04	7.60E-08
1317.46302	23.	6	0	6	6	3	3	4.59E-06	3.	4.69E-06	-2.2	2.13E-03	4.05E-05	-6.26E-07
1320.32745	4.	5	3	3	6	4	2	1.63E-04	2.	1.68E-04	-3.0	1.27E-02	2.64E-04	1.54E-06
1324.34966	14.	5	3	2	6	4	3	4.93E-04	2.	5.11E-04	-3.6	2.21E-02	4.63E-04	2.63E-06
1325.15868	25.	11	0	11	12	1	12	2.17E-05	2.	2.19E-05	-1.1	4.59E-03	8.99E-05	5.19E-08
1325.22735	25.	11	1	11	12	0	12	7.00E-06	6.	7.33E-06	-4.7	-2.66E-03	-5.19E-05	-2.92E-08
1326.81580	7.	9	2	7	10	3	8	1.68E-05	2.	1.71E-05	-2.0	4.05E-03	8.89E-05	6.26E-07
1327.73565	7.	4	1	4	5	2	3	3.66E-04	3.	3.74E-04	-2.1	1.90E-02	3.26E-04	2.53E-06
1328.43920	4.	11	1	10	12	2	11	5.40E-06	5.	5.69E-06	-5.4	2.33E-03	5.16E-05	9.49E-08
1330.32655	-31.	11	2	10	12	1	11	2.13E-06	10.	1.89E-06	11.2	-1.35E-03	-2.99E-05	-4.28E-08
1331.79503	28.	8	2	6	9	3	7	1.52E-05	5.	1.57E-05	-3.6	3.89E-03	8.14E-05	6.39E-07
1333.38430	42.	11	1	11	11	2	10	4.88E-06	4.	4.89E-06	-.3	-2.18E-03	-3.08E-05	9.67E-08
1333.97270	22.	11	0	11	11	1	10	1.55E-05	3.	1.48E-05	4.5	-3.79E-03	-5.35E-05	1.64E-07

Table 4. Dipole moment expansion coefficients derived from least-squares fit of the (020)-(000), (100)-(000), (001)-(000), (020)-(010), (100)-(010), and (001)-(010) bands of H<sub>2</sub><sup>16</sup>O.  
Values given in Debyes

j	(020)-(000) band	(100)-(000) band	(001)-(000) band
1	6.23 (18) × 10 <sup>-3</sup>	-1.610 (10) × 10 <sup>-2</sup>	7.28 (29) × 10 <sup>-2</sup>
2		3.39 (17) × 10 <sup>-6</sup>	8.11 (900) × 10 <sup>-6</sup>
3	-7.71 (578) × 10 <sup>-6</sup>	-2.38 (119) × 10 <sup>-5</sup>	-1.03 (36) × 10 <sup>-4</sup>
4	-7.72 (232) × 10 <sup>-5</sup>	1.326 (7) × 10 <sup>-3</sup>	-1.44 (29) × 10 <sup>-3</sup>
5	2.29 (160) × 10 <sup>-5</sup>	-5.44 (27) × 10 <sup>-4</sup>	
6	-2.43 (255) × 10 <sup>-6</sup>	2.36 (12) × 10 <sup>-6</sup>	4.49 (90) × 10 <sup>-4</sup>
7	-3.28 (245) × 10 <sup>-6</sup>	6.27 (310) × 10 <sup>-6</sup>	-4.62 (455) × 10 <sup>-6</sup>
8		2.88 (140) × 10 <sup>-6</sup>	1.19 (83) × 10 <sup>-5</sup>
9	2.95 (265) × 10 <sup>-7</sup>		
10	2.52 (345) × 10 <sup>-7</sup>	-2.10 (11) × 10 <sup>-7</sup>	
11	1.39 (173) × 10 <sup>-7</sup>		1.16 (133) × 10 <sup>-6</sup>
13	7.12 (700) × 10 <sup>-9</sup>		
14	-8.23 (329) × 10 <sup>-7</sup>		
15		2.17 (11) × 10 <sup>-7</sup>	
N <sup>b</sup>	328	308	621
σ% <sup>c</sup>	3.08	3.91	3.97
min v	2893.814 cm <sup>-1</sup>	3005.256 cm <sup>-1</sup>	3200.925 cm <sup>-1</sup>
max v	3817.968 cm <sup>-1</sup>	4062.921 cm <sup>-1</sup>	4407.628 cm <sup>-1</sup>
j	(020)-(010) band	(100)-(010) band	(010)-(010) band
1	-1.936 (97) × 10 <sup>-1</sup>	3.876 (19) × 10 <sup>-2</sup>	2.523 (75) × 10 <sup>-2</sup>
2	-1.40 (435) × 10 <sup>-5</sup>	7.21 (36) × 10 <sup>-6</sup>	
3	1.69 (9) × 10 <sup>-4</sup>	1.68 (10) × 10 <sup>-4</sup>	1.22 (98) × 10 <sup>-5</sup>
4	1.16 (6) × 10 <sup>-2</sup>	-1.28 (7) × 10 <sup>-3</sup>	3.68 (166) × 10 <sup>-4</sup>
5	3.74 (19) × 10 <sup>-4</sup>	1.76 (10) × 10 <sup>-5</sup>	
6	7.96 (40) × 10 <sup>-5</sup>	2.77 (15) × 10 <sup>-7</sup>	-6.89 (660) × 10 <sup>-5</sup>
7	-8.38 (42) × 10 <sup>-5</sup>	1.44 (7) × 10 <sup>-5</sup>	
8	6.19 (31) × 10 <sup>-5</sup>	3.30 (17) × 10 <sup>-6</sup>	
9	9.04 (45) × 10 <sup>-6</sup>	2.73 (14) × 10 <sup>-6</sup>	
10	-5.00 (25) × 10 <sup>-5</sup>	-7.51 (36) × 10 <sup>-6</sup>	
14	-3.20 (16) × 10 <sup>-6</sup>	2.68 (13) × 10 <sup>-7</sup>	
15	5.68 (29) × 10 <sup>-6</sup>	-1.27 (9) × 10 <sup>-6</sup>	
N <sup>b</sup>	345	111	90
σ% <sup>c</sup>	4.36	1.77	3.01
min v	1167.063 cm <sup>-1</sup>	1805.745 cm <sup>-1</sup>	1957.187 cm <sup>-1</sup>
max v	2103.532 cm <sup>-1</sup>	2297.455 cm <sup>-1</sup>	2323.963 cm <sup>-1</sup>

<sup>a</sup> Values given within parentheses are uncertainties in the last digit(s).

<sup>b</sup> N represents the number of line strengths used in the least-squares fits.

<sup>c</sup> σ% is the standard deviation resulting from the least-squares fit in percent;

$$\sigma\% = \left\{ \sum [(S_{obs} - S_{cal})^2 / S_{obs}]^2 / N \right\}^{1/2} \times 100.$$

Table 5 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	%s	computed strength	(o-c)%	Z(020)	Z(100)	Z(001)
1337.29594	8.	7 2 5	8 3 6	1.18E-04	2.	1.20E-04	-1.5	1.07E-02	2.17E-04	1.74E-06
1340.61970	13.	4 4 1	5 5 0	6.80E-04	3.	7.05E-04	-3.6	2.59E-02	6.42E-04	1.33E-07
1340.63508	2.	4 4 0	5 5 1	2.34E-04	3.	2.35E-04	-.5	1.50E-02	3.70E-04	7.69E-08
1343.97992	25.	10 1 9	11 2 10	5.34E-06	9.	5.85E-06	-9.5	2.37E-03	5.17E-05	9.72E-08
1344.45745	3.	10 0 10	11 1 11	2.44E-05	3.	2.07E-05	15.2	4.46E-03	8.76E-05	4.65E-08
1344.59257	7.	10 1 10	11 0 11	6.25E-05	2.	6.21E-05	.7	-7.73E-03	-1.52E-04	-7.62E-08
1344.72475	6.	6 2 4	7 3 5	9.25E-05	2.	9.37E-05	-1.3	9.49E-03	1.87E-04	1.41E-06
1346.00363	9.	4 3 2	5 4 1	1.02E-03	2.	1.05E-03	-3.2	3.18E-02	6.69E-04	2.00E-06
1347.03170	-4.	4 3 1	5 4 2	3.55E-04	3.	3.51E-04	1.0	1.84E-02	3.87E-04	1.14E-06
1347.46330	19.	10 2 9	11 1 10	1.85E-05	15.	1.74E-05	5.7	-4.09E-03	-9.03E-05	-1.05E-07
1348.49218	-1.	5 0 5	5 3 2	2.97E-05	3.	2.95E-05	.8	5.33E-03	1.00E-04	-1.33E-06
1351.57026	7.	4 2 3	5 3 2	1.04E-03	2.	1.07E-03	-2.8	3.21E-02	6.07E-04	3.21E-06
1355.20997	2.	5 2 3	6 3 4	5.97E-04	2.	6.11E-04	-2.4	2.42E-02	4.70E-04	2.98E-06
1356.03869	19.	10 1 10	10 2 9	4.24E-05	1.	4.08E-05	3.8	-6.29E-03	-9.25E-05	2.75E-07
1357.20580	13.	10 0 10	10 1 9	1.39E-05	5.	1.38E-05	.7	-3.66E-03	-5.39E-05	1.51E-07
1358.72210	11.	9 1 8	10 2 9	4.75E-05	4.	4.84E-05	-1.9	6.81E-03	1.47E-04	2.99E-07
1363.56426	17.	9 0 9	10 1 10	1.59E-04	4.	1.59E-04	-.1	1.24E-02	2.44E-04	1.20E-07
1363.83438	30.	9 1 9	10 0 10	5.35E-05	3.	5.29E-05	1.1	-7.13E-03	-1.41E-04	-6.20E-08
1365.09483	13.	9 2 8	10 1 9	1.64E-05	3.	1.60E-05	2.6	-3.91E-03	-8.60E-05	-6.84E-08
1369.38117	35.	4 0 4	4 3 1	1.27E-05	7.	1.11E-05	12.6	3.27E-03	6.13E-05	-7.46E-07
1369.53162	11.	4 2 2	5 3 3	4.03E-04	2.	4.07E-04	-1.1	1.98E-02	3.81E-04	1.75E-06
1370.89250	1.	3 3 1	4 4 0	6.45E-04	3.	6.45E-04	.1	2.49E-02	5.30E-04	8.72E-08
1371.03957	6.	3 3 0	4 4 1	1.93E-03	2.	1.94E-03	-.5	4.31E-02	9.19E-04	1.49E-07
1372.24454	17.	8 1 7	9 2 8	4.07E-05	10.	4.06E-05	.3	6.24E-03	1.32E-04	3.10E-07
1377.09010	12.	3 1 3	4 2 2	3.27E-04	2.	3.24E-04	.8	1.77E-02	3.13E-04	1.46E-06
1378.33738	4.	9 1 9	9 2 8	3.60E-05	6.	3.50E-05	2.7	-5.83E-03	-8.90E-05	2.50E-07
1378.54287	104.	9 3 7	10 2 8	5.40E-06	8.	4.55E-06	15.6	-2.08E-03	-5.35E-05	1.14E-07
1380.62377	-2.	9 0 9	9 1 8	1.12E-04	3.	1.07E-04	4.3	-1.02E-02	-1.55E-04	3.92E-07
1381.62658	-22.	3 0 3	3 3 0	1.46E-05	7.	1.56E-05	-6.6	3.87E-03	7.29E-05	-8.50E-07
1381.76365	0.	3 2 2	4 3 1	6.98E-04	3.	7.11E-04	-1.8	2.62E-02	5.01E-04	1.30E-06
1382.42322	-10.	8 0 8	9 1 9	1.24E-04	2.	1.23E-04	1.0	1.09E-02	2.14E-04	1.02E-07
1382.97018	13.	8 1 8	9 0 9	3.60E-04	4.	3.67E-04	-2.0	-1.88E-02	-3.71E-04	-1.37E-07
1383.65347	3.	8 2 7	9 1 8	1.16E-04	4.	1.18E-04	-1.7	-1.06E-02	-2.32E-04	-6.58E-08
1384.17043	8.	7 1 6	8 2 7	2.67E-04	2.	2.71E-04	-1.4	1.61E-02	3.32E-04	9.33E-07
1387.93376	9.	3 2 1	4 3 2	2.17E-03	3.	2.21E-03	-2.0	4.62E-02	8.89E-04	2.17E-06
1393.10953	16.	11 2 10	11 3 9	3.18E-06	10.	3.35E-06	-5.4	-1.80E-03	-3.08E-05	1.37E-07
1399.96342	37.	11 1 10	11 2 9	1.07E-05	6.	1.07E-05	.5	-3.21E-03	-5.45E-05	1.97E-07
1400.08714	9.	8 1 8	8 2 7	2.43E-04	2.	2.45E-04	-.6	-1.54E-02	-2.44E-04	6.53E-07
1400.94244	17.	7 0 7	8 1 8	7.67E-04	3.	7.66E-04	.1	2.71E-02	5.37E-04	2.59E-07
1401.09215	47.	10 4 7	11 3 8	9.77E-07	10.	1.07E-06	-9.7	-9.99E-04	-3.61E-05	4.05E-07
1402.05558	8.	7 1 7	8 0 8	2.56E-04	3.	2.55E-04	.5	-1.57E-02	-3.10E-04	-8.75E-08
1403.81360	-4.	7 2 6	8 1 7	8.56E-05	5.	8.41E-05	1.7	-8.98E-03	-1.95E-04	8.79E-08
1404.16867	10.	5 1 4	6 2 5	9.64E-04	2.	9.67E-04	-.3	3.05E-02	5.96E-04	2.10E-06
1404.44492	1.	8 0 8	8 1 7	8.57E-05	2.	8.44E-05	1.5	-9.04E-03	-1.43E-04	3.10E-07
1406.18836	2.	8 3 6	9 2 7	3.28E-05	2.	3.13E-05	4.4	-5.46E-03	-1.40E-04	6.06E-07
1408.52960	-1.	2 2 1	3 3 0	3.62E-03	3.	3.58E-03	1.0	5.87E-02	1.14E-03	0.00E+00
1409.75930	4.	2 2 0	3 3 1	1.20E-03	2.	1.21E-03	-.4	3.41E-02	6.59E-04	0.00E+00
1410.50156	8.	10 2 9	10 3 8	2.91E-05	2.	3.06E-05	-5.3	-5.44E-03	-9.52E-05	4.18E-07
1414.42239	4.	4 1 3	5 2 4	5.20E-04	2.	5.30E-04	-1.9	2.26E-02	4.31E-04	1.45E-06
1418.58232	7.	2 1 2	3 2 1	2.18E-03	2.	2.14E-03	2.0	4.54E-02	8.23E-04	1.74E-06
1418.96254	5.	6 0 6	7 1 7	4.85E-04	7.	4.77E-04	1.6	2.14E-02	4.22E-04	2.25E-07
1420.97899	12.	7 1 7	7 2 6	1.73E-04	1.	1.72E-04	.3	-1.29E-02	-2.11E-04	5.47E-07
1421.21602	2.	6 1 6	7 0 7	1.44E-03	3.	1.42E-03	1.0	-3.70E-02	-7.34E-04	-1.19E-07
1421.99412	35.	10 1 9	10 2 8	1.07E-05	3.	1.14E-05	-6.4	-3.32E-03	-5.74E-05	1.75E-07
1423.00315	10.	12 3 10	12 4 9	1.28E-06	10.	1.48E-06	-15.4	-1.20E-03	-2.00E-05	2.47E-07
1426.44060	2.	6 2 5	7 1 6	4.63E-04	2.	4.61E-04	.4	-2.10E-02	-4.56E-04	6.66E-07
1426.61036	12.	3 1 2	4 2 3	2.42E-03	3.	2.40E-03	.9	4.81E-02	9.05E-04	2.40E-06
1426.81001	1.	9 2 8	9 3 7	2.70E-05	4.	2.81E-05	-4.0	-5.21E-03	-9.32E-05	4.11E-07
1428.87901	12.	7 0 7	7 1 6	5.49E-04	2.	5.53E-04	-.6	-2.31E-02	-3.77E-04	6.54E-07
1436.23325	7.	5 0 5	6 1 6	2.38E-03	3.	2.38E-03	.0	4.79E-02	9.38E-04	6.01E-07
1437.80137	-19.	7 3 5	8 2 6	2.06E-05	4.	2.00E-05	2.9	-4.36E-03	-1.14E-04	8.04E-07
1440.57294	10.	6 1 6	6 2 5	9.85E-04	2.	9.85E-04	.0	-3.09E-02	-5.21E-04	1.33E-06
1440.69973	3.	5 1 5	6 0 6	7.86E-04	2.	7.83E-04	.4	-2.74E-02	-5.44E-04	0.00E+00
1441.54078	2.	8 2 7	8 3 6	1.98E-04	2.	2.07E-04	-4.7	-1.41E-02	-2.59E-04	1.17E-06
1441.55845	6.	2 1 1	3 2 2	1.12E-03	1.	1.11E-03	.9	3.27E-02	6.11E-04	9.05E-07
1444.75237	11.	9 1 8	9 2 7	9.91E-05	2.	1.01E-04	-1.7	-9.86E-03	-1.74E-04	4.27E-07
1445.18930	10.	10 3 8	10 4 7	1.97E-05	5.	1.74E-05	11.7	-4.09E-03	-8.49E-05	5.05E-07
1449.03484	216.	12 4 9	12 5 8	7.74E-07	15.	6.34E-07	18.0	-7.71E-04	-2.57E-05	-1.01E-07
1452.25230	6.	5 2 4	6 1 5	2.35E-04	3.	2.31E-04	1.8	-1.49E-02	-3.24E-04	8.82E-07
1452.46887	9.	4 0 4	5 1 5	1.16E-03	2.	1.16E-03	-.3	3.35E-02	6.50E-04	5.18E-07
1452.60714	14.	1 1 1	2 2 0	1.26E-03	3.	1.25E-03	.4	3.48E-02	6.40E-04	0.00E+00
1453.61740	17.	9 3 7	9 4 6	1.60E-05	3.	1.64E-05	-2.2	-3.96E-03	-8.28E-05	5.50E-07
1453.78870	7.	6 0 6	6 1 5	3.79E-04	2.	3.73E-04	1.5	-1.90E-02	-3.19E-04	3.99E-07
1454.21329	3.	7 2 6	7 3 5	1.48E-04	2.	1.50E-04	-1.6	-1.20E-02	-2.24E-04	1.06E-06

Table 5 continued

observed frequency	upper o-c	J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(020)	Z(100)	Z(001)
1458.32759	4.	5	1	5	5	2	4	5.38E-04	3.	5.55E-04	-3.1	-2.32E-02	-4.01E-04	1.04E-06
1458.86580	-3.	10	4	7	10	5	6	7.50E-06	7.	7.86E-06	-4.8	-2.73E-03	-6.88E-05	5.54E-07
1459.60785	6.	1	1	0	2	2	1	4.31E-03	3.	4.32E-03	-1.	6.45E-02	1.20E-03	0.00E+00
1459.88909	11.	8	3	6	8	4	5	1.18E-04	3.	1.19E-04	-7	-1.07E-02	-2.26E-04	1.65E-06
1460.93777	4.	4	1	4	5	0	5	3.40E-03	2.	3.36E-03	1.2	-5.68E-02	-1.13E-03	2.95E-07
1461.02146	0.	9	4	6	9	5	5	7.40E-06	8.	7.11E-06	3.9	-2.60E-03	-6.53E-05	6.13E-07
1462.10242	8.	8	4	5	8	5	4	5.01E-05	3.	4.99E-05	.4	-6.89E-03	-1.74E-04	1.82E-06
1462.52808	10.	7	4	4	7	5	3	3.35E-05	3.	3.27E-05	2.5	-5.58E-03	-1.41E-04	1.61E-06
1462.65790	13.	6	4	3	6	5	2	1.52E-04	4.	1.53E-04	-1.0	-1.21E-02	-3.10E-04	3.77E-06
1462.73212	15.	5	4	2	5	5	1	5.44E-05	2.	5.48E-05	-7	-7.22E-03	-1.86E-04	2.40E-06
1462.84390	8.	5	4	1	5	5	0	1.63E-04	2.	1.64E-04	-6	-1.25E-02	-3.22E-04	4.15E-06
1462.91100	11.	8	5	4	8	6	3	1.63E-05	2.	1.62E-05	.8	-3.90E-03	-1.25E-04	1.54E-06
1463.11550	21.	7	5	3	7	6	2	9.80E-06	5.	9.55E-06	2.6	-2.99E-03	-9.64E-05	1.30E-06
1463.17320	14.	6	4	2	6	5	1	5.16E-05	2.	5.13E-05	.6	-6.99E-03	-1.79E-04	2.17E-06
1463.20357	11.	7	5	2	7	6	1	2.96E-05	4.	2.86E-05	3.3	-5.19E-03	-1.66E-04	2.30E-06
1463.22457	7.	8	5	3	8	6	2	5.90E-06	3.	5.38E-06	8.8	-2.25E-03	-7.13E-05	9.19E-07
1463.37615	9.	6	5	2	6	6	1	3.63E-05	3.	3.44E-05	5.2	-5.68E-03	-1.84E-04	2.67E-06
1463.39823	20.	6	5	1	6	6	0	1.15E-05	3.	1.15E-05	.0	-3.29E-03	-1.06E-04	1.55E-06
1463.64894	25.	9	5	4	9	6	3	7.84E-06	4.	7.29E-06	7.0	-2.62E-03	-8.23E-05	9.54E-07
1464.10650	-2.	7	3	5	7	4	4	8.19E-05	1.	8.31E-05	-1.5	-8.93E-03	-1.90E-04	1.51E-06
1464.22728	12.	7	4	3	7	5	2	9.74E-05	3.	9.83E-05	-.9	-9.67E-03	-2.46E-04	2.77E-06
1464.45860	5.	6	2	5	6	3	4	8.42E-04	2.	8.54E-04	-1.5	-2.87E-02	-5.43E-04	2.74E-06
1464.61440	55.	11	2	9	11	3	8	6.84E-06	15.	7.97E-06	-16.5	-2.77E-03	-5.49E-05	1.21E-07
1466.18115	10.	8	4	4	8	5	3	1.07E-05	3.	1.07E-05	.4	-3.18E-03	-8.72E-05	1.85E-07
1466.58467	9.	6	3	4	6	4	3	4.39E-04	2.	4.37E-04	.5	-2.05E-02	-4.39E-04	3.79E-06
1466.89728	42.	7	0	7	6	3	4	4.75E-06	15.	4.44E-06	6.4	2.07E-03	4.40E-05	-2.42E-06
1467.02521	15.	8	1	7	8	2	6	9.25E-05	3.	9.26E-05	-.1	-9.46E-03	-1.70E-04	3.22E-07
1467.64578	5.	3	0	3	4	1	4	4.39E-03	2.	4.47E-03	-1.8	6.56E-02	1.26E-03	1.17E-06
1467.79761	3.	5	3	3	5	4	2	2.02E-04	2.	2.03E-04	-.7	-1.40E-02	-3.03E-04	2.81E-06
1467.84570	-74.	4	0	4	3	3	1	1.25E-06	10.	1.36E-06	-8.9	1.14E-03	2.30E-05	-6.85E-07
1468.07752	-10.	9	6	4	9	7	3	5.44E-07	15.	6.51E-07	-19.7	-7.77E-04	-3.10E-05	4.56E-07
1468.26691	7.	4	3	2	4	4	1	5.66E-04	2.	5.82E-04	-2.9	-2.36E-02	-5.16E-04	5.08E-06
1468.97067	-8.	7	6	2	7	7	1	1.89E-06	8.	1.79E-06	5.2	-1.28E-03	-5.48E-05	7.50E-07
1469.06620	-11.	7	6	1	7	7	0	5.37E-06	7.	5.41E-06	-.7	-2.23E-03	-9.79E-05	1.24E-06
1469.10838	-3.	4	3	1	4	4	0	1.99E-04	3.	1.95E-04	1.9	-1.37E-02	-2.99E-04	2.93E-06
1469.70384	-13.	9	6	3	9	7	2	1.34E-06	21.	1.10E-06	18.1	-1.03E-03	-2.00E-05	2.02E-06
1470.74880	5.	9	4	5	9	5	4	2.10E-05	4.	2.16E-05	-3.0	-4.54E-03	-1.13E-04	1.05E-06
1470.86857	7.	5	3	2	5	4	1	6.15E-04	2.	6.16E-04	-.1	-2.43E-02	-5.27E-04	4.83E-06
1472.37361	9.	6	3	4	7	2	5	1.00E-04	4.	9.62E-05	3.8	-9.56E-03	-2.53E-04	2.56E-06
1473.68798	4.	4	1	4	4	2	3	2.30E-03	2.	2.43E-03	-2.3	-4.85E-02	-8.62E-04	2.33E-06
1474.62835	15.	6	3	3	6	4	2	1.48E-04	3.	1.49E-04	-.8	-1.20E-02	-2.58E-04	2.14E-06
1476.97267	0.	10	4	6	10	5	5	3.09E-06	12.	2.70E-06	12.7	-1.60E-03	-4.00E-05	3.48E-07
1477.06498	11.	8	4	5	9	3	6	6.31E-06	6.	5.85E-06	7.3	-2.33E-03	-8.63E-05	1.70E-06
1477.24887	7.	4	2	3	4	3	2	1.71E-03	3.	1.72E-03	-.9	-4.07E-02	-7.92E-04	4.63E-06
1478.12352	6.	5	0	5	5	1	4	2.14E-03	2.	2.12E-03	.9	-4.53E-02	-7.84E-04	6.35E-07
1480.22931	4.	3	2	2	3	3	1	4.88E-04	2.	5.01E-04	-2.7	-2.20E-02	-4.30E-04	2.69E-06
1480.69783	12.	7	3	4	7	4	3	2.60E-04	2.	2.62E-04	-.7	-1.58E-02	-3.41E-04	2.47E-06
1481.20152	6.	4	2	3	5	1	4	8.15E-04	2.	8.28E-04	-1.6	-2.82E-02	-6.18E-04	2.51E-06
1482.47752	4.	2	0	2	3	1	3	1.68E-03	2.	1.67E-03	.5	4.01E-02	7.62E-04	6.79E-07
1482.53995	4.	3	1	3	4	0	4	1.34E-03	1.	1.33E-03	.6	-3.58E-02	-7.11E-04	4.11E-07
1484.50477	-8.	11	4	7	11	5	6	2.24E-06	18.	2.67E-06	-19.1	-1.59E-03	-3.97E-05	2.59E-07
1485.13367	6.	3	2	1	3	3	0	1.55E-03	2.	1.55E-03	.1	-3.86E-02	-7.58E-04	4.59E-06
1486.20351	1.	3	1	3	3	2	2	9.71E-04	2.	9.77E-04	-.7	-3.07E-02	-5.57E-04	1.59E-06
1486.74372	7.	7	1	6	7	2	5	7.04E-04	2.	7.04E-04	.0	-2.61E-02	-4.76E-04	7.29E-07
1488.18614	-12.	8	3	5	8	4	4	4.10E-05	7.	4.34E-05	-5.8	-6.45E-03	-1.39E-04	8.50E-07
1490.02220	1.	4	2	2	4	3	1	6.00E-04	2.	6.23E-04	-3.8	-2.45E-02	-4.81E-04	2.58E-06
1494.87176	7.	9	2	7	9	3	6	9.15E-05	3.	9.35E-05	-2.2	-9.48E-03	-1.87E-04	4.47E-07
1495.03790	1.	9	3	6	9	4	5	5.24E-05	2.	5.51E-05	-5.1	-7.27E-03	-1.57E-04	7.85E-07
1495.61177	6.	2	1	2	2	2	1	2.48E-03	3.	2.49E-03	-.4	-4.90E-02	-9.03E-04	2.72E-06
1496.42796	8.	5	2	3	5	3	2	1.57E-03	2.	1.59E-03	-.3	-3.91E-02	-7.68E-04	3.51E-06
1498.37987	-3.	1	0	1	2	1	2	5.01E-03	3.	4.92E-03	1.8	6.88E-02	1.30E-03	7.38E-07
1498.51666	1.	11	3	8	11	4	7	7.00E-06	15.	5.84E-06	16.6	-2.36E-03	-5.19E-05	1.57E-07
1499.82828	12.	4	0	4	4	1	3	1.26E-03	2.	1.24E-03	1.3	-3.46E-02	-6.16E-04	3.30E-07
1501.89186	1.	6	1	5	6	2	4	5.16E-04	2.	5.25E-04	-1.7	-2.25E-02	-4.17E-04	5.92E-07
1502.08951	-4.	6	2	4	6	3	3	3.52E-04	1.	3.59E-04	-1.9	-1.86E-02	-3.66E-04	1.39E-06
1502.43598	8.	8	2	6	8	3	5	8.52E-05	2.	8.59E-05	-.8	-9.09E-03	-1.79E-04	4.76E-07
1502.66029	-6.	8	1	8	7	2	5	5.10E-06	8.	4.78E-06	6.2	-2.15E-03	-4.28E-05	2.50E-06
1504.61318	1.	7	2	5	7	3	4	5.75E-04	2.	5.86E-04	-2.0	-2.37E-02	-4.68E-04	1.46E-06
1506.02072	6.	2	1	2	3	0	3	3.74E-03	3.	3.68E-03	1.5	-5.95E-02	-1.18E-03	1.05E-06
1508.30200	-27.	5	3	3	6	2	4	4.50E-05	10.	4.27E-05	5.1	-6.36E-03	-1.71E-04	2.22E-06
1511.48600	5.	5	1	4	5	2	3	2.90E-03	2.	2.94E-03	-1.3	-5.32E-02	-9.96E-04	1.52E-06
1511.85972	10.	2	1	1	2	2	0	1.12E-03	1.	1.12E-03	-.1	-3.29E-02	-6.17E-04	1.61E-06
1515.29152	8.	3	1	2	3	2	1	4.76E-03	2.	4.72E-03	1.2	-6.75E-02	-1.27E-03	2.77E-06
1515.67389	-2.	4	1	3	4	2	2	1.50E-03	2.	1.44E-03	3.8	-3.73E-02	-7.02E-04	1.26E-06

Table 5 continued

observed frequency	upper o-c	J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>b</sub>	computed strength	(o-c)t <sub>b</sub>	Z(020)	Z(100)	Z(001)
1516.66293	-5.	0	0	0	1	1	1	1.35E-03	3.	1.37E-03	-1.5	3.63E-02	6.80E-04	0.00E+00
1516.82905	1.	3	0	3	3	1	2	5.66E-03	6.	5.75E-03	-1.7	-7.45E-02	-1.36E-03	6.20E-07
1528.31132	9.	2	0	2	2	1	1	2.38E-03	2.	2.35E-03	1.1	-4.76E-02	-8.63E-04	4.45E-07
1531.12885	7.	1	1	1	2	0	2	7.44E-04	2.	7.28E-04	2.1	-2.65E-02	-5.28E-04	5.31E-07
1534.93555	7.	1	0	1	1	1	0	6.31E-03	2.	6.10E-03	3.3	-7.67E-02	-1.44E-03	8.36E-07
1543.73200	15.	2	2	1	3	1	2	4.40E-04	3.	4.36E-04	1.0	-2.04E-02	-4.56E-04	2.60E-06
1543.89750	14.	4	3	2	5	2	3	1.36E-04	3.	1.35E-04	.7	-1.13E-02	-3.10E-04	4.69E-06
1547.89040	18.	6	1	6	5	2	3	5.39E-05	3.	5.38E-05	.2	-7.20E-03	-1.36E-04	4.25E-06
1556.50480	7.	3	1	3	2	2	0	1.02E-04	3.	1.03E-04	-.5	-9.94E-03	-1.87E-04	1.85E-06
1561.44510	16.	5	3	2	6	2	5	7.31E-05	4.	6.79E-05	7.1	-7.99E-03	-2.54E-04	6.18E-06
1562.36930	16.	4	1	4	3	2	1	2.90E-04	2.	2.89E-04	.2	-1.67E-02	-3.14E-04	4.53E-06
1571.15262	8.	3	2	1	4	1	4	1.83E-04	3.	1.77E-04	3.5	-1.30E-02	-3.32E-04	4.53E-06
1573.10995	-20.	4	2	2	5	1	5	2.83E-05	5.	2.91E-05	-3.0	-5.25E-03	-1.48E-04	2.95E-06
1574.44880	6.	4	2	3	3	3	0	1.74E-04	2.	1.75E-04	-.5	-1.30E-02	-2.66E-04	4.47E-06
1574.57438	0.	4	3	1	5	2	4	3.49E-05	6.	3.34E-05	4.4	-5.61E-03	-1.68E-04	3.56E-06
1577.61003	1.	3	3	1	4	2	2	3.36E-05	10.	3.08E-05	8.3	-5.40E-03	-1.49E-04	2.43E-06
1577.72704	9.	2	2	0	3	1	3	7.04E-05	3.	6.42E-05	8.9	-7.82E-03	-1.89E-04	1.81E-06
1578.55674	-70.	10	2	9	9	3	6	1.33E-06	5.	1.40E-06	-5.1	-1.16E-03	-2.63E-05	1.79E-06
1583.35635	8.	1	1	0	1	0	1	5.56E-03	3.	5.47E-03	1.5	-7.25E-02	-1.46E-03	0.00E+00
1584.16884	-3.	5	2	3	6	1	6	3.23E-05	3.	3.03E-05	6.0	-5.34E-03	-1.75E-04	5.13E-06
1586.28360	30.	5	4	2	6	3	3	9.33E-06	2.	7.93E-06	15.0	-2.71E-03	-1.05E-04	3.21E-06
1586.99412	4.	2	0	2	1	1	1	9.45E-04	2.	9.36E-04	1.0	-3.00E-02	-5.71E-04	7.27E-07
1588.48779	-2.	4	2	2	3	3	1	6.60E-05	4.	6.52E-05	1.2	-7.91E-03	-1.64E-04	2.48E-06
1589.87429	4.	5	3	3	4	4	0	1.89E-05	4.	1.81E-05	4.2	-4.16E-03	-9.77E-05	2.46E-06
1590.38145	5.	2	1	1	2	0	2	2.06E-03	3.	2.00E-03	3.0	-4.38E-02	-8.92E-04	-2.57E-07
1592.32098	8.	3	1	2	2	2	1	6.99E-04	1.	6.92E-04	1.0	-2.58E-02	-5.04E-04	3.13E-06
1592.59902	6.	5	2	4	4	3	1	7.51E-05	2.	7.42E-05	1.2	-8.44E-03	-1.75E-04	3.54E-06
1592.62249	10.	3	3	0	4	2	3	8.58E-05	2.	8.25E-05	3.9	-8.83E-03	-2.55E-04	4.83E-06
1593.13188	8.	5	3	2	4	4	1	5.46E-05	3.	5.50E-05	-.8	-7.25E-03	-1.70E-04	4.21E-06
1597.27471	5.	5	4	1	6	3	4	2.53E-05	3.	2.29E-05	9.5	-4.60E-03	-1.87E-04	6.22E-06
1597.45119	4.	9	2	8	8	3	5	1.88E-06	11.	2.10E-06	-12.0	-1.42E-03	-3.12E-05	1.66E-06
1601.34713	10.	1	1	1	0	0	0	1.41E-03	2.	1.39E-03	1.1	3.66E-02	7.31E-04	4.80E-07
1602.73000	15.	3	1	2	3	0	3	4.53E-03	2.	4.47E-03	1.3	-6.55E-02	-1.36E-03	-9.57E-07
1603.58944	19.	6	2	4	7	1	7	2.77E-06	4.	2.81E-06	-1.5	-1.61E-03	-6.67E-05	2.79E-06
1605.67658	10.	6	2	5	5	3	2	1.56E-04	2.	1.56E-04	-.1	-1.22E-02	-2.56E-04	6.36E-06
1608.85835	28.	8	2	7	7	3	4	2.45E-05	3.	2.42E-05	1.4	-4.82E-03	-1.03E-04	4.23E-06
1609.91153	-32.	6	4	2	5	5	1	4.87E-06	15.	4.13E-06	15.2	-1.98E-03	-5.61E-05	1.81E-06
1611.57830	18.	7	2	6	6	3	3	2.42E-05	6.	2.42E-05	.2	-4.82E-03	-1.02E-04	3.21E-06
1612.18115	4.	3	0	3	2	1	2	5.19E-03	3.	5.18E-03	.1	-7.06E-02	-1.35E-03	1.51E-06
1619.36032	13.	2	1	2	1	0	1	5.70E-03	2.	5.69E-03	.2	-7.40E-02	-1.47E-03	1.91E-06
1620.33598	13.	3	2	1	3	1	2	3.44E-03	4.	3.42E-03	.7	-5.72E-02	-1.26E-03	1.77E-06
1620.36856	29.	4	4	0	5	3	3	7.00E-06	20.	6.28E-06	10.3	-2.41E-03	-9.40E-05	3.06E-06
1620.46955	2.	4	2	2	4	1	3	1.02E-03	2.	1.02E-03	.1	-3.12E-02	-6.85E-04	6.15E-07
1621.12390	6.	4	1	3	4	0	4	8.65E-04	3.	8.64E-04	.1	-2.88E-02	-6.13E-04	-7.13E-07
1622.09854	17.	6	3	3	5	4	2	3.05E-05	5.	2.44E-05	20.0	-4.83E-03	-1.15E-04	3.08E-06
1622.10658	9.	5	2	3	4	3	2	2.94E-04	2.	2.98E-04	-1.4	-1.69E-02	-3.58E-04	5.65E-06
1624.78748	5.	4	1	3	3	2	2	4.18E-04	1.	4.16E-04	.5	-2.00E-02	-3.99E-04	2.46E-06
1626.05920	5.	5	2	3	5	1	4	1.98E-03	3.	1.97E-03	.3	-4.35E-02	-9.59E-04	3.94E-07
1633.68995	23.	7	4	4	6	5	1	5.32E-06	4.	4.95E-06	6.9	-2.17E-03	-6.24E-05	2.19E-06
1634.44920	19.	7	3	5	6	4	2	1.64E-05	13.	1.78E-05	-8.6	-4.12E-03	-9.95E-05	3.14E-06
1635.02652	1.	3	1	3	2	0	2	2.15E-03	10.	2.23E-03	-3.5	4.63E-02	9.12E-04	1.40E-06
1635.81430	17.	4	0	4	3	1	3	1.94E-03	3.	2.10E-03	-8.2	-4.49E-02	-8.64E-04	6.82E-07
1638.41545	6.	6	2	4	6	1	5	3.48E-04	3.	3.24E-04	6.9	-1.76E-02	-3.95E-04	2.47E-09
1639.08392	0.	2	2	1	2	1	2	1.77E-03	3.	1.79E-03	-1.1	-4.14E-02	-9.48E-04	2.00E-06
1644.68822	12.	5	1	4	5	0	5	1.28E-03	2.	1.31E-03	-2.1	-3.54E-02	-7.85E-04	-1.19E-06
1648.19705	9.	3	2	2	3	1	3	6.58E-04	3.	6.66E-04	-1.2	-2.52E-02	-5.85E-04	1.00E-06
1649.80765	10.	4	1	4	3	0	3	6.82E-03	3.	6.88E-03	-.9	8.14E-02	1.59E-03	2.14E-06
1657.38977	10.	5	0	5	4	1	4	5.99E-03	5.	5.97E-03	.3	-7.58E-02	-1.46E-03	6.76E-07
1657.43837	6.	5	1	4	4	2	3	1.43E-03	2.	1.44E-03	-.5	-3.71E-02	-7.60E-04	4.20E-06
1657.56828	11.	8	4	5	7	5	2	1.13E-05	2.	1.06E-05	6.4	-3.16E-03	-9.30E-05	3.51E-06
1657.75839	14.	7	2	5	7	1	6	3.86E-04	3.	3.86E-04	-.1	-1.92E-02	-4.43E-04	-6.80E-08
1658.27150	7.	6	2	4	5	3	3	9.60E-05	2.	9.62E-05	-.2	-9.60E-03	-2.09E-04	3.26E-06
1658.60135	10.	8	5	4	7	6	1	2.27E-06	8.	2.32E-06	-2.1	-1.47E-03	-5.50E-05	2.05E-06
1660.24445	11.	7	3	4	7	2	5	3.17E-04	3.	3.20E-04	-.9	-1.75E-02	-4.22E-04	1.25E-06
1660.46775	8.	4	2	3	4	1	4	1.54E-03	2.	1.55E-03	-.7	-3.85E-02	-9.08E-04	1.13E-06
1662.60312	6.	6	3	3	6	2	4	1.90E-04	3.	1.90E-04	-4.4	-1.37E-02	-3.38E-04	1.30E-06
1664.06362	14.	8	3	5	8	2	6	4.45E-05	2.	4.51E-05	-1.3	-6.56E-03	-1.57E-04	3.77E-07
1665.02906	2.	5	1	5	4	0	4	2.06E-03	2.	2.06E-03	.1	4.45E-02	8.64E-04	8.44E-07
1665.25063	50.	9	3	7	8	4	4	4.35E-06	7.	3.83E-06	12.0	-1.91E-03	-4.79E-05	1.97E-06
1668.76240	8.	5	3	2	5	2	3	8.90E-04	2.	8.92E-04	-.2	-2.91E-02	-7.33E-04	3.65E-06
1671.30196	1.	6	1	5	6	0	6	1.87E-04	5.	2.04E-04	-9.2	-1.40E-02	-3.27E-04	-5.44E-07
1675.40649	35.	9	3	6	9	2	7	3.80E-05	6.	4.54E-05	-19.4	-6.58E-03	-1.57E-04	3.75E-07
1675.63957	7.	2	2	1	1	1	0	3.87E-03	3.	4.01E-03	-3.5	6.19E-02	1.40E-03	3.04E-06
1675.68690	-2.	5	2	4	5	1	5	3.37E-04	4.	3.24E-04	3.8	-1.76E-02	-4.27E-04	3.16E-07

Table 5 continued

observed frequency	o-c	upper J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(020)	Z(100)	Z(001)
1675.82595	1.	4	3	1	4	2	2	3.59E-04	2.	3.58E-04	.4	-1.84E-02	-4.77E-04	2.92E-06
1677.10027	76.	4	3	2	5	0	5	4.45E-06	3.	4.76E-06	-6.9	2.09E-03	9.49E-05	-4.36E-06
1677.22342	11.	6	0	6	5	1	5	1.61E-03	3.	1.58E-03	1.9	-3.90E-02	-7.48E-04	1.78E-07
1681.09221	-16.	6	1	6	5	0	5	5.58E-03	20.	4.79E-03	14.2	6.79E-02	1.31E-03	8.19E-07
1681.30373	14.	3	3	0	3	2	1	9.19E-04	2.	9.16E-04	.3	-2.95E-02	-7.80E-04	5.57E-06
1682.24372	17.	2	2	0	1	1	1	1.16E-03	3.	1.16E-03	-1	3.33E-02	7.62E-04	1.94E-06
1682.87177	31.	8	2	6	8	1	7	4.37E-05	3.	4.47E-05	-2.2	-6.53E-03	-1.56E-04	3.14E-08
1686.72362	8.	3	3	1	3	2	2	3.00E-04	1.	2.98E-04	.6	-1.68E-02	-4.51E-04	3.35E-06
1688.92990	10.	6	1	5	5	2	4	4.35E-04	2.	4.30E-04	1.1	-2.03E-02	-4.25E-04	1.89E-06
1689.84988	16.	4	3	2	4	2	3	1.00E-03	1.	9.89E-04	1.1	-3.06E-02	-8.19E-04	5.65E-06
1690.36847	3.	8	3	5	7	4	4	1.16E-05	1.	1.23E-05	-5.8	-3.42E-03	-8.57E-05	2.40E-06
1692.16181	0.	9	4	5	8	5	4	6.29E-06	25.	5.79E-06	8.0	-2.34E-03	-6.99E-05	2.73E-06
1693.41734	-13.	6	2	5	6	1	6	5.12E-04	7.	5.25E-04	-2.6	-2.24E-02	-5.59E-04	1.49E-07
1694.03075	4.	3	2	2	2	1	1	1.15E-03	1.	1.17E-03	-1.9	3.35E-02	7.54E-04	3.22E-06
1694.33528	79.	10	3	7	10	2	8	3.96E-06	53.	4.16E-06	-5.0	-1.99E-03	-4.72E-05	1.64E-07
1695.34032	10.	5	3	3	5	2	4	2.20E-04	5.	2.47E-04	-12.1	-1.53E-02	-4.09E-04	2.61E-06
1695.77620	-2.	7	2	5	6	3	4	2.34E-04	5.	2.19E-04	6.2	-1.45E-02	-3.27E-04	4.70E-06
1697.73832	6.	7	1	7	6	0	6	1.06E-03	2.	1.09E-03	-2.9	3.24E-02	6.21E-04	2.23E-07
1698.69313	-16.	7	1	6	7	0	7	2.50E-04	15.	2.71E-04	-8.4	-1.61E-02	-3.99E-04	-6.52E-07
1703.68010	10.	6	3	4	6	2	5	4.40E-04	2.	4.39E-04	.3	-2.04E-02	-5.48E-04	3.26E-06
1709.65120	22.	4	2	3	3	1	2	2.82E-03	8.	2.90E-03	-2.7	5.26E-02	1.18E-03	6.70E-06
1711.46230	11.	9	2	7	9	1	8	4.21E-05	5.	4.25E-05	-1.0	-6.36E-03	-1.58E-04	2.22E-07
1713.07816	34.	7	2	6	7	1	7	7.70E-05	6.	8.34E-05	-8.3	-8.90E-03	-2.32E-04	0.00E+00
1713.70907	-2.	8	0	8	7	1	7	6.54E-04	2.	6.60E-04	-1.0	-2.52E-02	-4.79E-04	0.00E+00
1714.61005	6.	8	1	8	7	0	7	1.95E-03	2.	1.98E-03	-1.7	4.37E-02	8.32E-04	0.00E+00
1715.52389	44.	8	4	4	8	3	5	1.29E-05	10.	1.14E-05	11.9	-3.42E-03	4.55E-05	3.95E-06
1715.68798	6.	3	2	1	2	1	2	2.18E-03	1.	2.21E-03	-1.4	4.59E-02	1.08E-03	6.82E-06
1718.05025	12.	7	1	6	6	2	5	9.39E-04	5.	9.42E-04	-.3	-3.00E-02	-6.43E-04	2.11E-06
1723.04628	-2.	5	2	4	4	1	3	7.44E-04	1.	7.47E-04	-.3	2.67E-02	5.99E-04	3.61E-06
1725.37470	-1.	8	1	7	8	0	8	3.75E-05	2.	3.71E-05	1.1	-5.93E-03	-1.57E-04	-2.40E-07
1725.51910	11.	7	4	3	7	3	4	1.18E-04	2.	1.12E-04	4.9	-1.03E-02	-2.99E-04	4.00E-06
1729.10695	17.	9	3	6	8	4	5	1.05E-05	5.	1.09E-05	-2.3	-4.24E-03	-1.11E-04	2.94E-06
1729.42065	7.	8	3	6	8	2	7	9.17E-05	6.	9.05E-05	1.3	-9.26E-03	-2.52E-04	1.51E-06
1731.03700	12.	9	0	9	8	1	8	1.05E-03	1.	1.08E-03	-2.8	-3.22E-02	-6.07E-04	6.90E-08
1731.46775	7.	9	1	9	8	0	8	3.52E-04	2.	3.59E-04	-2.0	1.86E-02	3.51E-04	0.00E+00
1734.06658	5.	8	2	7	8	1	8	1.03E-04	9.	1.07E-04	-3.5	-1.00E-02	-2.74E-04	-1.36E-07
1735.30782	7.	6	2	5	5	1	4	1.58E-03	2.	1.60E-03	-1.2	3.91E-02	8.76E-04	4.71E-06
1738.49267	8.	5	4	1	5	3	2	2.92E-04	2.	2.85E-04	2.4	-1.64E-02	-5.23E-04	8.32E-06
1740.85885	-10.	4	4	0	4	3	1	9.21E-05	2.	9.37E-05	-1.7	-9.38E-03	-3.08E-04	5.18E-06
1741.94705	10.	4	4	1	4	3	2	2.85E-04	2.	2.80E-04	1.6	-1.62E-02	-5.35E-04	9.05E-06
1742.46528	10.	5	4	2	5	3	3	9.40E-05	4.	9.46E-05	-.7	-9.43E-03	-3.05E-04	4.99E-06
1743.80287	8.	6	4	3	6	3	4	2.04E-04	4.	1.95E-04	4.6	-1.35E-02	-4.29E-04	6.79E-06
1744.29829	21.	8	1	7	7	2	6	1.87E-04	7.	1.92E-04	-2.7	-1.36E-02	-2.96E-04	6.75E-07
1746.34658	-8.	9	3	7	9	2	8	1.07E-05	4.	1.11E-05	-3.5	-3.24E-03	-8.79E-05	6.11E-07
1746.61513	15.	7	4	4	7	3	5	3.60E-05	5.	3.52E-05	2.1	-5.76E-03	-1.78E-04	2.78E-06
1747.90405	9.	7	2	6	6	1	5	3.36E-04	2.	3.46E-04	-3.0	1.82E-02	4.07E-04	1.67E-06
1747.97627	18.	10	0	10	9	1	9	1.73E-04	2.	1.75E-04	-1.4	-1.30E-02	-2.43E-04	4.17E-08
1748.18403	2.	10	1	10	9	0	9	5.05E-04	3.	5.27E-04	-4.4	2.25E-02	4.21E-04	-4.27E-08
1750.86790	40.	9	1	8	9	0	9	3.92E-05	11.	4.22E-05	-7.6	-6.32E-03	-1.78E-04	-2.57E-07
1751.54279	10.	8	4	5	8	3	6	5.47E-05	15.	4.78E-05	12.6	-6.72E-03	-2.00E-04	3.22E-06
1756.45550	0.	4	2	2	3	1	3	3.72E-04	2.	3.72E-04	0	1.88E-02	4.67E-04	5.49E-06
1757.02473	-4.	3	3	1	2	2	0	9.77E-04	3.	9.98E-04	-2.2	3.08E-02	8.34E-04	3.55E-06
1758.33304	-1.	3	3	0	2	2	1	2.89E-03	4.	2.98E-03	-3.0	5.31E-02	1.45E-03	6.28E-06
1762.00325	10.	8	2	7	7	1	6	6.03E-04	6.	6.01E-04	.3	2.40E-02	5.39E-04	1.45E-06
1764.59770	9.	11	0	11	10	1	10	2.25E-04	2.	2.33E-04	-3.7	-1.50E-02	-2.77E-04	7.01E-08
1764.69964	9.	11	1	11	10	0	10	8.19E-05	6.	7.77E-05	5.1	8.65E-03	1.60E-04	-3.49E-08
1767.98465	15.	9	1	8	8	2	7	3.07E-04	6.	3.01E-04	2.0	-1.70E-02	-3.78E-04	6.05E-07
1768.74252	52.	3	3	0	3	0	3	1.59E-05	13.	1.56E-05	1.8	3.82E-03	1.32E-04	-1.92E-06
1769.34910	-41.	9	2	7	8	3	6	8.50E-05	10.	7.54E-05	11.2	-8.48E-03	-2.09E-04	2.02E-06
1777.88725	54.	9	2	8	8	1	7	9.00E-05	15.	1.02E-04	-13.9	9.90E-03	2.24E-04	3.33E-07
1778.08840	16.	10	2	9	10	1	10	1.45E-05	15.	1.44E-05	.4	-3.69E-03	-1.13E-04	-1.12E-07
1778.53098	6.	4	3	2	3	2	1	2.01E-03	2.	2.04E-03	-1.4	4.39E-02	1.20E-03	1.05E-05
1780.94010	28.	12	0	12	11	1	11	3.03E-05	6.	3.11E-05	-2.7	-5.48E-03	-1.00E-04	3.52E-08
1780.99110	13.	12	1	12	11	0	11	9.75E-05	5.	9.34E-05	4.2	9.49E-03	1.73E-04	-5.76E-08
1784.93955	9.	4	3	1	3	2	2	7.57E-04	15.	6.56E-04	13.3	2.49E-02	6.91E-04	6.56E-06
1789.79850	-10.	10	1	9	9	2	8	5.24E-05	6.	4.60E-05	12.2	-6.63E-03	-1.50E-04	1.88E-07
1795.14785	-9.	10	2	9	9	1	8	1.34E-04	5.	1.39E-04	-3.8	1.15E-02	2.63E-04	1.51E-07
1796.49800	23.	7	5	2	7	4	3	3.77E-05	9.	3.51E-05	6.8	-5.69E-03	-2.41E-04	6.68E-06
1796.59180	2.	5	3	3	4	2	2	4.20E-04	3.	4.19E-04	.2	1.99E-02	5.47E-04	6.84E-06
1797.02714	8.	13	0	13	12	1	12	3.22E-05	10.	3.40E-05	-5.6	-5.73E-03	-1.03E-04	4.76E-08
1797.05350	40.	13	1	13	12	0	12	1.05E-05	5.	1.13E-05	-7.6	3.30E-03	5.96E-05	-2.69E-08
1798.19510	-40.	6	5	1	6	4	2	2.17E-05	8.	1.93E-05	11.0	-4.21E-03	-1.92E-04	4.99E-06
1798.64990	-34.	5	5	0	5	4	1	6.95E-05	4.	6.40E-05	7.9	-7.60E-03	-4.12E-04	7.92E-06
1798.80984	142.	5	5	1	5	4	2	2.54E-05	15.	2.13E-05	16.1	-4.44E-03	-1.83E-04	6.06E-06

Table 5 continued

observed frequency	o-c	upper J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(020)	Z(100)	Z(001)
1798.95766	38.	6	5	2	6	4	3	6.34E-05	7.	5.77E-05	9.0	-7.32E-03	-2.63E-04	7.86E-06
1801.96435	-12.	5	3	2	5	0	5	3.18E-05	12.	2.83E-05	10.9	5.13E-03	1.97E-04	-3.38E-06
1802.78625	9.	10	2	8	9	3	7	1.36E-05	15.	1.17E-05	14.1	-3.33E-03	-8.63E-05	5.66E-07
1805.32552	16.	5	2	3	4	1	4	4.48E-04	3.	4.62E-04	-3.2	2.09E-02	5.64E-04	1.12E-05
1810.39038	5.	11	1	10	10	2	9	4.97E-05	9.	5.56E-05	-11.8	-7.29E-03	-1.67E-04	1.92E-07
1810.99745	7.	6	3	4	5	2	3	7.20E-04	1.	7.20E-04	.1	2.61E-02	7.18E-04	1.07E-05
1812.87770	-4.	14	0	14	13	1	13	3.74E-06	10.	3.78E-06	-1.1	-1.91E-03	-3.41E-05	2.36E-08
1812.89180	-14.	14	1	14	13	0	13	1.13E-05	7.	1.13E-05	.1	3.30E-03	5.85E-05	-3.38E-08
1813.23315	0.	11	2	10	10	1	9	1.86E-05	6.	1.87E-05	-.7	4.23E-03	9.77E-05	-9.82E-09
1814.71477	9.	5	3	2	4	2	3	1.09E-03	1.	1.11E-03	-2.0	3.24E-02	9.27E-04	1.43E-05
1822.42390	3.	7	3	5	6	2	4	1.32E-04	2.	1.28E-04	3.1	1.10E-02	3.04E-04	4.69E-06
1831.72590	2.	12	2	11	11	1	10	1.99E-05	2.	2.04E-05	-2.6	4.42E-03	1.03E-04	-6.59E-08
1831.99394	6.	8	3	6	7	2	5	1.98E-04	2.	1.92E-04	2.8	1.35E-02	3.75E-04	5.39E-06
1832.01290	-26.	6	3	3	6	0	6	4.73E-06	8.	4.76E-06	-.6	2.09E-03	9.08E-05	-1.88E-06
1832.92695	-12.	11	2	9	10	3	8	1.51E-05	6.	1.39E-05	7.7	-3.63E-03	-1.00E-04	2.44E-07
1839.14698	9.	4	4	1	3	3	0	1.39E-03	2.	1.43E-03	-3.1	3.66E-02	1.24E-03	8.24E-06
1839.32465	8.	4	4	0	3	3	1	4.55E-04	3.	4.77E-04	-4.9	2.11E-02	7.19E-04	4.77E-06
1841.12740	5.	9	3	7	8	2	6	3.20E-05	3.	2.99E-05	6.5	5.32E-03	1.49E-04	1.82E-06
1849.57920	28.	13	1	12	12	2	11	6.33E-06	7.	6.69E-06	-5.7	-2.53E-03	-5.93E-05	8.32E-08
1849.64100	-1.	6	3	3	5	2	4	1.69E-04	5.	1.70E-04	-.7	1.26E-02	3.85E-04	8.72E-06
1851.33776	5.	10	3	8	9	2	7	4.10E-05	5.	3.81E-05	7.0	6.00E-03	1.72E-04	1.72E-06
1854.27768	-27.	6	6	0	6	5	1	3.73E-06	4.	3.97E-06	-6.5	-1.73E-03	-2.63E-04	-3.61E-06
1854.81091	8.	7	6	1	7	5	2	8.28E-06	7.	8.81E-06	-6.4	-2.89E-03	-8.95E-05	1.46E-05
1854.84030	-53.	7	6	2	7	5	3	2.84E-06	4.	3.08E-06	-8.6	-1.61E-03	-1.60E-04	1.02E-05
1855.11898	-85.	10	6	5	10	5	6	7.99E-07	15.	7.69E-07	3.8	-7.75E-04	-1.05E-04	2.56E-06
1855.17165	-18.	8	6	3	8	5	4	4.59E-06	6.	4.98E-06	-8.5	-1.99E-03	-2.49E-04	8.01E-06
1858.82490	-15.	12	2	10	11	3	9	1.20E-06	15.	1.17E-06	2.8	-1.03E-03	-4.86E-05	-1.70E-06
1861.85023	16.	6	2	4	5	1	5	5.56E-05	3.	5.57E-05	-.1	7.23E-03	2.22E-04	6.89E-06
1862.95595	9.	5	4	2	4	3	1	2.81E-04	2.	2.84E-04	-1.1	1.63E-02	5.67E-04	7.84E-06
1864.17141	21.	5	4	1	4	3	2	8.34E-04	2.	8.51E-04	-2.1	2.82E-02	9.83E-04	1.38E-05
1865.96949	16.	4	3	2	3	0	3	4.19E-05	5.	4.43E-05	-5.8	-6.43E-03	-2.28E-04	-4.11E-06
1868.12347	-39.	5	4	1	5	1	4	4.47E-06	15.	4.36E-06	2.6	1.99E-03	1.03E-04	-3.87E-06
1872.19400	2.	7	3	4	7	0	7	4.41E-06	4.	4.65E-06	-5.5	2.05E-03	1.08E-04	-2.86E-06
1878.66410	3.	7	4	3	7	1	6	4.93E-06	8.	4.82E-06	2.2	2.11E-03	8.57E-05	-4.67E-06
1879.02570	-64.	12	3	10	11	2	9	5.00E-06	20.	4.62E-06	7.5	2.10E-03	4.66E-05	-1.04E-06
1885.02080	8.	6	4	3	5	3	2	4.54E-04	2.	4.50E-04	.9	2.05E-02	7.31E-04	1.52E-05
1889.64500	-6.	6	4	2	5	3	3	1.67E-04	15.	1.48E-04	11.1	1.17E-02	4.27E-04	9.23E-06
1891.55095	13.	7	3	4	6	2	5	1.90E-04	2.	1.89E-04	-.3	1.33E-02	4.45E-04	1.43E-05
1902.04177	6.	5	3	3	4	0	4	1.83E-05	3.	1.87E-05	-2.1	-4.16E-03	-1.59E-04	-4.58E-06
1903.97990	6.	7	4	4	6	3	3	7.26E-05	4.	7.00E-05	3.6	8.06E-03	2.96E-04	7.85E-06
1908.56620	74.	9	7	2	9	6	3	4.50E-07	15.	5.37E-07	-19.3	-6.66E-04	-6.96E-05	2.66E-06
1913.34349	-26.	14	3	12	13	2	11	3.37E-07	15.	3.95E-07	-17.2	6.10E-04	1.84E-05	1.67E-08
1916.68202	-2.	7	4	3	6	3	4	2.04E-04	2.	2.03E-04	.4	1.37E-02	5.28E-04	1.57E-05
1918.86014	14.	8	4	5	7	3	4	9.40E-05	1.	8.76E-05	6.8	9.01E-03	3.41E-04	1.03E-05
1920.88524	15.	5	5	1	4	4	0	1.48E-04	3.	1.55E-04	-4.8	1.19E-02	5.32E-04	5.04E-06
1920.91335	-19.	5	5	0	4	4	1	4.42E-04	3.	4.59E-04	-3.9	2.05E-02	8.83E-04	6.73E-06
1924.73525	11.	7	2	5	6	1	6	5.36E-05	4.	5.56E-05	-3.6	7.18E-03	2.65E-04	1.22E-05
1929.70780	16.	9	4	6	8	3	5	1.21E-05	4.	1.11E-05	7.9	3.21E-03	1.24E-04	4.00E-06
1937.46080	-6.	10	4	7	9	3	6	1.28E-05	5.	1.18E-05	7.6	3.30E-03	1.33E-04	4.27E-06
1941.33638	-12.	8	3	5	7	2	6	1.91E-05	2.	1.92E-05	-.3	4.21E-03	1.63E-04	7.28E-06
1944.19960	7.	6	3	4	5	0	5	4.03E-05	3.	4.30E-05	-6.7	-6.28E-03	-2.70E-04	-1.12E-05
1945.47630	4.	6	5	2	5	4	1	2.33E-04	3.	2.41E-04	-3.6	1.48E-02	6.94E-04	1.22E-05
1945.66570	3.	6	5	1	5	4	2	7.85E-05	3.	8.01E-05	-2.0	0.56E-03	3.86E-04	7.13E-06
1948.51268	9.	12	4	9	11	3	8	1.25E-06	10.	1.09E-06	12.5	9.76E-04	6.62E-05	3.41E-06
1969.38075	31.	7	5	3	6	4	2	3.82E-05	4.	3.68E-05	3.7	5.77E-03	2.87E-04	8.60E-06
1970.25561	15.	7	5	2	6	4	3	1.13E-04	2.	1.10E-04	2.6	1.00E-02	4.76E-04	1.38E-05
1972.76337	166.	6	4	3	6	1	6	5.86E-07	15.	5.65E-07	3.6	6.82E-04	7.33E-05	-3.70E-06
1981.60201	-15.	9	4	5	8	3	6	2.70E-05	2.	2.46E-05	9.0	4.73E-03	2.13E-04	1.04E-05
1994.85891	19.	8	5	3	7	4	4	1.62E-05	2.	1.47E-05	9.0	3.65E-03	1.86E-04	7.38E-06
1998.63840	2.	9	3	6	8	2	7	1.58E-05	6.	1.46E-05	7.6	3.63E-03	1.77E-04	1.07E-05
2000.90351	21.	6	6	1	5	5	0	9.02E-05	2.	9.92E-05	-10.0	9.31E-03	6.10E-04	4.47E-05
2001.01687	13.	6	6	0	5	5	1	3.35E-05	3.	3.58E-05	-6.7	5.69E-03	2.89E-04	-1.82E-06
2011.95069	1.	9	5	5	8	4	4	6.11E-06	4.	5.21E-06	14.8	2.15E-03	1.29E-04	6.21E-06
2014.65195	-4.	6	4	3	5	1	4	8.50E-06	12.	9.13E-06	-7.5	-2.84E-03	-1.79E-04	-7.59E-06
2019.96452	-9.	9	5	4	8	4	5	1.81E-05	3.	1.54E-05	15.1	3.70E-03	2.07E-04	1.10E-05
2026.00236	-21.	7	6	2	6	5	1	1.62E-05	5.	1.59E-05	1.9	3.77E-03	2.08E-04	9.78E-06
2026.12047	-22.	7	6	1	6	5	2	4.77E-05	3.	4.87E-05	-2.1	6.51E-03	4.49E-04	1.68E-05
2046.48780	37.	10	5	5	9	4	6	1.37E-06	15.	1.50E-06	-9.3	1.15E-03	7.46E-05	3.74E-07
2050.63783	17.	8	6	3	7	5	2	1.90E-05	3.	1.81E-05	4.5	4.05E-03	1.99E-04	1.06E-05
2051.04685	15.	8	6	2	7	5	3	6.30E-06	4.	5.37E-06	14.8	2.31E-03	2.01E-05	-1.17E-05
2061.87495	-33.	9	2	7	8	1	8	4.81E-06	4.	5.06E-06	-5.2	2.09E-03	1.47E-04	1.20E-05
2072.00483	-25.	8	4	5	7	1	6	5.75E-06	5.	6.23E-06	-8.4	-2.30E-03	-1.88E-04	-1.28E-05
2097.94460	20.	10	6	4	9	5	5	5.68E-07	15.	6.08E-07	-7.1	6.38E-04	1.30E-04	1.19E-05
2099.47700	0.	9	3	7	8	0	8	1.04E-06	15.	1.21E-06	-16.8	-9.97E-04	-9.66E-05	-8.18E-06

Table 5 continued

observed frequency	upper o-c	J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t	Z(020)	Z(100)	Z(001)
2103.52888	-36.	8	7	2	7	6	1	6.93E-06	4.	7.31E-06	-5.5	2.48E-03	2.20E-04	5.73E-06
2103.53195	-20.	8	7	1	7	6	2	2.31E-06	4.	2.44E-06	-5.7	1.43E-03	1.27E-04	3.30E-06
2110.14257	-63.	9	4	6	8	1	7	9.08E-07	15.	9.61E-07	-5.8	-8.78E-04	-9.48E-05	-7.54E-06
2128.45472	-26.	9	7	2	8	6	3	2.72E-06	1.	2.23E-06	17.9	1.36E-03	1.33E-04	4.79E-06
2129.95970	88.	11	3	8	10	2	9	5.41E-07	15.	5.96E-07	-10.1	6.84E-04	8.04E-05	7.44E-06
2131.84200	72.	10	2	8	9	1	9	4.18E-07	15.	4.50E-07	-7.6	5.91E-04	7.31E-05	6.76E-06
2154.05210	74.	10	4	7	9	1	8	1.05E-06	15.	9.68E-07	7.8	-8.29E-04	-1.42E-04	-1.22E-05

Computed frequencies ( $\text{cm}^{-1}$ ) derived from energy levels given in ref. 1 for the (010) state and Table 1 for the upper state. o-c, observed minus computed  $\times 10^5$

(o-c)t, observed minus computed line strengths given in percent. Computed values are derived from constants obtained in this work.

Z(020), Z(100), Z(001) are the contributions of the three states from which the computed strengths are derived:

$$S(\text{calc.}) = [Z(020)+Z(100)+Z(001)]^2$$

Table 6. Observed and computed line strengths (cm<sup>-2</sup>/atm. at 296K) of the (100)-(010) band of H<sub>2</sub><sup>16</sup>O

observed frequency	o-c	upper J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t	Z(100)	Z(020)	Z(001)
1247.88147	2.	8	0	8	9	5	5	2.25E-06	5.	2.30E-06	-2.1	2.25E-05	1.49E-03	-3.58E-09
1467.22532	9.	8	0	8	8	5	3	7.24E-06	5.	6.04E-06	16.6	-4.28E-05	-2.41E-03	4.64E-08
1778.97593	-51.	4	3	2	5	4	1	1.16E-05	15.	1.05E-05	9.9	-7.13E-03	3.90E-03	2.30E-06
1805.59269	5.	3	3	1	4	4	0	5.94E-06	18.	6.80E-06	-14.4	-5.66E-03	3.05E-03	1.00E-07
1805.74540	-12.	3	3	0	4	4	1	2.12E-05	7.	2.04E-05	3.9	-9.78E-03	5.26E-03	1.71E-07
1820.82040	-37.	4	2	3	5	3	2	1.24E-05	9.	1.05E-05	15.6	-7.01E-03	3.77E-03	3.73E-06
1823.60620	-30.	4	1	4	5	2	3	3.10E-06	6.	3.40E-06	-9.7	-4.05E-03	2.20E-03	2.96E-06
1837.88433	14.	8	2	7	9	1	8	2.25E-06	15.	1.91E-06	14.9	2.63E-03	-1.25E-03	-7.59E-08
1840.15110	-53.	4	2	2	5	3	3	4.41E-06	11.	4.00E-06	9.3	-4.24E-03	2.24E-03	2.03E-06
1852.95850	-8.	3	2	2	4	3	1	6.90E-06	15.	7.31E-06	-5.9	-5.75E-03	3.05E-03	1.51E-06
1853.24850	-34.	7	1	6	8	2	7	4.16E-06	10.	4.15E-06	.1	-3.95E-03	1.91E-03	1.08E-06
1854.56759	-45.	9	0	9	10	1	10	2.53E-06	15.	2.68E-06	-6.0	-3.00E-03	1.37E-03	1.40E-07
1854.65569	44.	9	1	9	10	0	10	1.09E-06	15.	8.93E-07	18.1	1.73E-03	-7.90E-04	-7.22E-08
1859.94775	-31.	3	2	1	4	3	2	2.18E-05	5.	2.28E-05	-4.7	-1.01E-02	5.32E-03	2.52E-06
1862.87750	16.	7	2	6	8	1	7	1.54E-06	30.	1.37E-06	11.2	2.22E-03	-1.05E-03	1.01E-07
1871.62602	-172.	9	0	9	9	1	8	6.29E-07	15.	6.22E-07	1.1	1.83E-03	-1.04E-03	4.56E-07
1873.63830	-32.	3	1	3	4	2	2	3.42E-06	15.	3.24E-06	5.4	-3.81E-03	2.01E-03	1.70E-06
1874.78000	-3.	8	1	8	9	0	9	5.60E-06	12.	6.06E-06	-8.2	4.55E-03	-2.09E-03	-1.60E-07
1881.07850	-12.	2	2	1	3	3	0	3.85E-05	4.	3.85E-05	.0	-1.30E-02	6.83E-03	0.00E+00
1882.51770	-32.	2	2	0	3	3	1	1.27E-05	7.	1.29E-05	-1.7	-7.54E-03	3.95E-03	0.00E+00
1888.25020	13.	5	1	4	6	2	5	1.34E-05	3.	1.32E-05	1.2	-7.19E-03	3.55E-03	2.44E-06
1889.65981	-99.	6	2	5	7	1	6	6.44E-06	15.	7.53E-06	-16.9	5.20E-03	-2.45E-03	7.67E-07
1891.89760	57.	8	1	8	8	2	7	1.61E-06	13.	1.65E-06	-2.3	2.86E-03	-1.58E-03	7.59E-07
1894.51755	-13.	7	0	7	8	1	8	1.15E-05	5.	1.24E-05	-7.8	-6.55E-03	3.03E-03	3.01E-07
1894.52760	-84.	6	3	4	6	4	3	4.12E-06	20.	4.66E-06	-13.1	4.55E-03	-2.40E-03	4.31E-06
1894.92080	-22.	7	1	7	8	0	8	3.76E-06	21.	4.15E-06	-10.5	3.78E-03	-1.74E-03	-1.02E-07
1901.23950	-24.	4	3	2	4	4	1	6.93E-06	5.	6.67E-06	3.7	5.45E-03	-2.87E-03	5.79E-06
1902.07560	2.	5	3	2	5	4	1	5.45E-06	5.	5.94E-06	-9.1	5.10E-03	-2.67E-03	5.49E-06
1902.23489	-8.	4	3	1	4	4	0	2.21E-06	9.	2.18E-06	1.5	3.10E-03	-1.63E-03	3.33E-06
1912.85110	-186.	7	3	4	7	4	3	2.63E-06	15.	2.57E-06	2.3	3.35E-03	-1.75E-03	2.81E-06
1913.27764	68.	7	2	6	7	3	5	1.59E-06	15.	1.31E-06	17.8	2.45E-03	-1.31E-03	1.22E-06
1914.22550	6.	6	0	6	7	1	7	7.80E-06	7.	7.56E-06	3.1	-5.15E-03	2.40E-03	2.62E-07
1915.16053	23.	6	1	6	7	0	7	2.24E-05	6.	2.26E-05	-1.1	8.89E-03	-4.14E-03	-1.38E-07
1915.56180	15.	2	1	2	3	2	1	2.23E-05	5.	2.30E-05	-3.3	-9.90E-03	5.10E-03	2.02E-06
1919.37654	20.	3	1	2	4	2	3	2.87E-05	3.	2.92E-05	-1.6	-1.09E-02	5.46E-03	2.78E-06
1922.45190	-240.	7	0	7	7	1	6	3.85E-06	22.	3.94E-06	-2.4	4.31E-03	-2.33E-03	7.59E-07
1927.67890	13.	6	2	5	6	3	4	8.64E-06	5.	8.02E-06	7.1	5.99E-03	-3.16E-03	3.14E-06
1933.55485	7.	5	0	5	6	1	6	3.89E-05	3.	3.69E-05	5.0	-1.14E-02	5.37E-03	6.97E-07
1934.51730	16.	6	1	6	6	2	5	8.36E-06	5.	7.95E-06	4.9	6.07E-03	-3.26E-03	1.54E-06
1935.67600	4.	5	1	5	6	0	6	1.23E-05	5.	1.22E-05	.5	6.57E-03	-3.07E-03	0.00E+00
1936.67680	2.	2	1	1	3	2	2	1.31E-05	6.	1.30E-05	.4	-7.30E-03	3.69E-03	1.05E-06
1938.72410	-8.	5	2	4	5	3	3	5.44E-06	8.	4.57E-06	15.9	4.48E-03	-2.35E-03	2.50E-06
1946.49933	-5.	4	2	3	4	3	2	1.97E-05	10.	1.85E-05	6.3	8.95E-03	-4.66E-03	5.31E-06
1947.40265	-16.	8	0	8	7	3	5	1.08E-05	4.	8.75E-06	19.0	-1.15E-04	3.07E-03	-1.37E-06
1949.80735	20.	1	1	1	2	2	0	1.45E-05	3.	1.42E-05	2.0	-7.67E-03	3.90E-03	0.00E+00
1950.45200	-4.	4	2	3	5	1	4	1.55E-05	8.	1.43E-05	7.7	7.04E-03	-3.26E-03	2.88E-06
1951.42414	-6.	3	2	2	3	3	1	6.09E-06	2.	5.64E-06	7.4	4.91E-03	-2.54E-03	3.09E-06
1952.11566	-88.	8	2	6	8	3	5	8.54E-07	13.	7.42E-07	13.1	1.80E-03	-9.36E-04	5.43E-07
1952.18817	17.	4	0	4	5	1	5	1.81E-05	5.	1.76E-05	2.5	-7.96E-03	3.75E-03	6.00E-07
1953.30352	-29.	5	1	5	5	2	4	5.03E-06	3.	4.92E-06	2.2	4.69E-03	-2.47E-03	1.20E-06
1955.82218	4.	7	1	6	7	2	5	5.20E-06	5.	5.35E-06	-2.9	4.90E-03	-2.59E-03	8.36E-07
1956.18565	12.	1	1	0	2	2	1	4.94E-05	2.	5.01E-05	-1.4	-1.43E-02	7.24E-03	0.00E+00
1956.80879	14.	4	1	4	5	0	5	5.23E-05	3.	5.16E-05	1.4	1.35E-02	-6.35E-03	3.42E-07
1957.14780	-20.	3	2	1	3	3	0	1.80E-05	4.	1.73E-05	3.8	8.56E-03	-4.40E-03	5.28E-06
1960.64210	-21.	4	2	2	4	3	1	6.40E-06	9.	6.53E-06	-2.0	5.25E-03	-2.70E-03	2.96E-06
1963.19095	-12.	7	2	5	7	3	4	5.77E-06	5.	5.60E-06	2.9	4.89E-03	-2.52E-03	1.67E-06
1965.42575	9.	5	2	3	5	3	2	1.73E-05	4.	1.65E-05	4.6	8.36E-03	-4.30E-03	4.02E-06
1966.93504	18.	6	2	4	6	3	3	3.53E-06	15.	3.63E-06	-2.9	3.92E-03	-2.02E-03	1.58E-06
1969.55890	4.	4	1	4	4	2	3	2.35E-05	3.	2.39E-05	-1.7	1.01E-02	-5.26E-03	2.69E-06
1969.77538	11.	3	0	3	4	1	4	6.62E-05	1.	6.50E-05	1.8	-1.54E-02	7.36E-03	1.36E-06
1975.44500	-6.	5	0	5	5	1	4	1.75E-05	2.	1.75E-05	-.1	8.72E-03	-4.54E-03	7.34E-07
1979.07161	9.	6	1	5	6	2	4	4.75E-06	10.	4.51E-06	5.1	4.40E-03	-2.28E-03	6.79E-07
1979.08866	11.	3	1	3	4	0	4	2.00E-05	3.	2.03E-05	-1.7	8.51E-03	-4.00E-03	4.75E-07
1982.75202	-12.	3	1	3	3	2	2	1.01E-05	2.	1.04E-05	-2.7	6.60E-03	-3.38E-03	1.84E-06
1983.40586	-6.	3	2	2	4	1	3	4.61E-06	4.	4.47E-06	3.0	3.90E-03	-1.79E-03	2.03E-06

Table 6 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(100)	Z(020)	Z(001)
1986.45830	2.	2 0 2	3 1 3	2.36E-05	6.	2.32E-05	1.7	-9.29E-03	4.47E-03	7.86E-07
1992.59070	-41.	2 1 2	2 2 1	2.57E-05	19.	2.81E-05	-9.5	1.08E-02	-5.47E-03	3.14E-06
1995.56745	0.	5 1 4	5 2 3	2.97E-05	6.	2.84E-05	4.2	1.09E-02	-5.58E-03	1.75E-06
1999.54746	8.	4 0 4	4 1 3	1.13E-05	6.	1.14E-05	-.5	6.88E-03	-3.51E-03	3.81E-07
2003.00025	19.	2 1 2	3 0 3	5.69E-05	3.	5.59E-05	1.8	1.41E-02	-6.63E-03	1.21E-06
2003.39240	27.	1 0 1	2 1 2	6.49E-05	4.	6.56E-05	-1.1	-1.57E-02	7.62E-03	8.53E-07
2004.90165	-2.	4 1 3	4 2 2	1.63E-05	3.	1.59E-05	2.4	8.01E-03	-4.02E-03	1.45E-06
2006.97787	-14.	2 1 1	2 2 0	1.36E-05	2.	1.34E-05	1.4	7.33E-03	-3.67E-03	1.86E-06
2008.05774	20.	3 1 2	3 2 1	5.54E-05	5.	5.52E-05	.3	1.49E-02	-7.44E-03	3.19E-06
2016.28095	9.	2 2 1	3 1 2	8.81E-06	8.	8.02E-06	8.9	5.18E-03	-2.35E-03	2.97E-06
2018.95874	16.	3 0 3	3 1 2	5.86E-05	6.	6.01E-05	-2.6	1.55E-02	-7.74E-03	7.16E-07
2022.08620	6.	0 0 0	1 1 1	1.78E-05	4.	1.78E-05	-.1	-8.23E-03	4.01E-03	0.00E+00
2024.33910	22.	5 3 2	4 4 1	6.77E-07	10.	6.55E-07	3.3	1.73E-03	-9.25E-04	4.75E-06
2028.32900	7.	1 1 1	2 0 2	1.13E-05	9.	1.12E-05	1.3	6.28E-03	-2.95E-03	6.12E-07
2032.29215	12.	2 0 2	2 1 1	2.83E-05	4.	2.77E-05	2.1	1.04E-02	-5.13E-03	5.14E-07
2039.94795	24.	1 0 1	1 1 0	7.88E-05	3.	7.86E-05	.3	1.73E-02	-8.46E-03	9.64E-07
2043.69947	15.	4 2 3	3 3 0	2.32E-06	18.	2.42E-06	-4.3	3.18E-03	-1.63E-03	5.10E-06
2050.48460	-111.	2 2 0	3 1 3	1.16E-06	9.	1.04E-06	10.6	1.76E-03	-7.47E-04	2.07E-06
2053.05146	-191.	3 1 3	2 2 0	1.53E-06	17.	1.36E-06	11.4	2.35E-03	-1.18E-03	2.12E-06
2058.24020	14.	4 1 4	3 2 1	4.40E-06	6.	3.89E-06	11.5	4.02E-03	-2.06E-03	5.20E-06
2059.21520	34.	5 2 4	4 3 1	1.23E-06	15.	1.05E-06	15.0	2.11E-03	-1.09E-03	4.01E-06
2068.89660	-10.	6 2 5	5 3 2	2.25E-06	10.	2.23E-06	.7	3.13E-03	-1.64E-03	7.22E-06
2070.64190	8.	7 2 6	6 3 3	3.32E-07	15.	3.44E-07	-3.7	1.26E-03	-6.82E-04	3.65E-06
2079.93424	23.	1 1 0	1 0 1	8.84E-05	2.	8.48E-05	4.1	1.73E-02	-8.06E-03	0.00E+00
2085.08698	-2.	3 1 2	2 2 1	1.08E-05	6.	1.02E-05	5.7	6.26E-03	-3.07E-03	3.59E-06
2085.49980	1.	2 1 1	2 0 2	3.19E-05	4.	3.20E-05	-.3	1.05E-02	-4.88E-03	-2.94E-07
2090.97502	14.	2 0 2	1 1 1	1.41E-05	5.	1.35E-05	4.0	7.13E-03	-3.45E-03	8.35E-07
2091.08960	-5.	4 2 2	4 1 3	2.34E-05	3.	2.03E-05	13.4	8.27E-03	-3.77E-03	6.99E-07
2091.10400	-27.	5 2 3	4 3 2	5.48E-06	11.	4.41E-06	19.6	4.21E-03	-2.11E-03	6.42E-06
2092.35047	23.	3 2 1	3 1 2	7.52E-05	3.	7.05E-05	6.2	1.54E-02	-7.00E-03	2.01E-06
2092.39984	25.	7 3 4	7 2 5	7.99E-06	9.	8.76E-06	-9.6	5.39E-03	-2.43E-03	1.40E-06
2093.51590	27.	8 3 5	8 2 6	1.10E-06	15.	1.25E-06	-13.6	2.03E-03	-9.10E-04	4.23E-07
2095.05705	12.	5 2 3	5 1 4	3.63E-05	3.	4.07E-05	-12.1	1.17E-02	-5.28E-03	4.46E-07
2095.49605	10.	3 1 2	3 0 3	7.69E-05	2.	7.51E-05	2.3	1.60E-02	-7.30E-03	-1.10E-06
2096.31950	4.	2 2 0	2 1 1	1.75E-05	5.	1.69E-05	3.6	7.48E-03	-3.38E-03	1.35E-06
2098.54710	-8.	1 1 1	0 0 0	2.05E-05	7.	2.11E-05	-3.2	-8.65E-03	4.05E-03	5.50E-07
2099.83660	-12.	9 3 6	9 2 7	1.18E-06	15.	1.33E-06	-12.3	2.06E-03	-9.13E-04	4.21E-07
2110.35168	8.	4 1 3	4 0 4	1.55E-05	4.	1.59E-05	-2.5	7.21E-03	-3.22E-03	-8.14E-07
2111.63309	16.	2 2 1	2 1 2	3.73E-05	2.	3.55E-05	4.9	1.07E-02	-4.72E-03	2.27E-06
2114.01534	15.	4 1 3	3 2 2	7.39E-06	5.	6.62E-06	10.4	5.00E-03	-2.43E-03	2.80E-06
2114.31084	19.	3 0 3	2 1 2	7.61E-05	2.	7.65E-05	-.6	1.69E-02	-8.11E-03	1.73E-06
2116.33950	-9.	2 1 2	1 0 1	8.10E-05	4.	8.46E-05	-4.4	-1.74E-02	8.18E-03	2.18E-06
2119.39190	1.	3 2 2	3 1 3	1.42E-05	3.	1.38E-05	2.9	6.59E-03	-2.88E-03	1.14E-06
2122.82270	8.	4 3 2	4 2 3	3.07E-05	3.	2.67E-05	13.0	8.96E-03	-3.79E-03	6.33E-06
2123.11729	55.	6 2 4	5 3 3	1.62E-06	12.	1.61E-06	.6	2.50E-03	-1.24E-03	3.69E-06
2126.13462	-10.	5 3 3	5 2 4	8.01E-06	9.	6.88E-06	14.1	4.54E-03	-1.92E-03	2.92E-06
2128.76970	10.	5 1 4	5 0 5	2.80E-05	2.	2.69E-05	3.9	9.18E-03	-3.99E-03	-1.36E-06
2129.71804	-21.	4 2 3	4 1 4	3.60E-05	4.	3.38E-05	6.0	1.02E-02	-4.38E-03	1.28E-06
2131.57510	-5.	3 1 3	2 0 2	3.16E-05	3.	3.26E-05	-3.0	-1.08E-02	5.11E-03	1.59E-06
2131.62395	9.	6 3 4	6 2 5	1.55E-05	11.	1.29E-05	16.9	6.16E-03	-2.58E-03	3.63E-06
2132.55200	-10.	8 2 6	8 1 7	1.26E-06	15.	1.25E-06	.6	1.94E-03	-8.20E-04	3.54E-08
2135.07590	20.	10 4 7	10 3 8	3.07E-07	15.	2.89E-07	5.8	8.85E-04	-3.49E-04	1.54E-06
2135.53365	30.	4 0 4	3 1 3	3.00E-05	4.	3.06E-05	-2.0	1.06E-02	-5.10E-03	7.79E-07
2139.27852	-29.	7 3 5	7 2 6	2.64E-06	15.	2.25E-06	14.6	2.55E-03	-1.05E-03	1.43E-06
2141.51980	-1.	5 1 4	4 2 3	2.48E-05	3.	2.48E-05	.0	9.49E-03	-4.52E-03	4.76E-06
2142.30290	8.	5 2 4	5 1 5	8.08E-06	5.	7.65E-06	5.4	4.77E-03	-2.01E-03	3.58E-07
2145.67858	11.	4 1 4	3 0 3	9.68E-05	2.	9.79E-05	-1.1	-1.89E-02	8.97E-03	2.45E-06
2148.18870	19.	2 2 1	1 1 0	7.33E-05	3.	7.56E-05	-3.1	-1.57E-02	7.05E-03	3.45E-06
2148.48180	18.	6 1 5	6 0 6	5.06E-06	12.	4.91E-06	2.9	3.81E-03	-1.59E-03	-6.17E-07
2148.83367	39.	8 3 6	8 2 7	2.95E-06	6.	3.12E-06	-5.8	2.96E-03	-1.19E-03	1.68E-06
2149.61971	-3.	9 2 7	9 1 8	1.72E-06	27.	1.42E-06	17.5	2.00E-03	-8.12E-04	2.49E-07
2154.35421	9.	7 2 5	6 3 4	4.71E-06	6.	4.14E-06	12.1	3.94E-03	-1.91E-03	5.30E-06
2154.71139	12.	5 0 5	4 1 4	8.13E-05	3.	8.48E-05	-4.3	1.77E-02	-8.49E-03	7.71E-07
2155.00239	8.	2 2 0	1 1 1	1.96E-05	4.	2.13E-05	-8.5	-8.29E-03	3.67E-03	2.19E-06
2156.63776	7.	6 2 5	6 1 6	1.32E-05	3.	1.36E-05	-3.0	6.24E-03	-2.56E-03	1.68E-07
2159.84510	-266.	9 3 7	9 2 8	3.92E-07	15.	4.26E-07	-8.6	1.07E-03	-4.21E-04	6.79E-07

Table 6 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	computed strength	t <sub>s</sub>	(o-c)t <sub>s</sub>	Z(100)	Z(020)	Z(001)
2160.00555	25.	5 1 5	4 0 4	2.85E-05	3.	2.86E-05	-.3	-1.02E-02	4.90E-03	9.61E-07
2165.22580	16.	3 2 2	2 1 1	2.03E-05	3.	2.17E-05	-6.8	-8.47E-03	3.81E-03	3.65E-06
2166.10964	17.	6 1 5	5 2 4	7.60E-06	3.	7.64E-06	-.5	5.24E-03	-2.48E-03	2.14E-06
2167.77188	10.	7 1 6	7 0 7	7.25E-06	5.	7.54E-06	-4.0	4.58E-03	-1.84E-03	-7.37E-07
2171.84027	257.	10 3 8	10 2 9	4.28E-07	15.	4.74E-07	-10.7	1.10E-03	-4.17E-04	8.83E-07
2172.14161	9.	7 2 6	7 1 7	2.71E-06	4.	2.42E-06	10.8	2.57E-03	-1.02E-03	0.00E+00
2172.48610	-16.	6 0 6	5 1 5	2.05E-05	4.	2.20E-05	-7.2	9.00E-03	-4.31E-03	2.02E-07
2175.03687	20.	6 1 6	5 0 5	6.56E-05	2.	6.60E-05	-.6	-1.56E-02	7.46E-03	9.32E-07
2178.90162	6.	4 2 3	3 1 2	4.84E-05	1.	5.28E-05	-9.1	-1.33E-02	5.99E-03	7.56E-06
2182.95207	35.	8 2 6	7 3 5	1.19E-06	18.	9.63E-07	19.0	1.87E-03	-8.89E-04	2.17E-06
2187.12898	36.	7 1 6	6 2 5	1.83E-05	7.	1.68E-05	8.3	7.71E-03	-3.62E-03	2.38E-06
2188.29824	96.	8 2 7	8 1 8	3.17E-06	14.	3.53E-06	-11.5	3.03E-03	-1.15E-03	-1.53E-07
2189.43125	6.	7 0 7	6 1 6	4.59E-05	5.	4.47E-05	2.5	1.28E-02	-6.16E-03	0.00E+00
2189.66226	6.	5 2 4	4 1 3	1.25E-05	5.	1.33E-05	-6.6	-6.70E-03	3.05E-03	4.06E-06
2190.60382	4.	7 1 7	6 0 6	1.41E-05	8.	1.48E-05	-5.3	-7.40E-03	3.55E-03	2.54E-07
2191.72486	-6.	3 3 1	2 2 0	2.10E-05	4.	2.45E-05	-16.6	-8.61E-03	3.66E-03	3.96E-06
2198.52802	5.	6 2 5	5 1 4	2.58E-05	5.	2.80E-05	-8.6	-9.78E-03	4.48E-03	5.30E-06
2203.68310	-101.	9 1 8	9 0 9	1.63E-06	15.	1.60E-06	1.9	1.99E-03	-7.22E-04	-2.89E-07
2205.04942	39.	8 1 7	7 2 6	4.15E-06	10.	3.38E-06	18.6	3.45E-03	-1.61E-03	7.58E-07
2206.26751	14.	8 0 8	7 1 7	5.70E-06	5.	5.38E-06	5.6	4.56E-03	-2.24E-03	0.00E+00
2206.42002	5.	8 1 8	7 0 7	2.61E-05	4.	2.68E-05	-2.6	-9.94E-03	4.76E-03	0.00E+00
2206.96788	22.	7 2 6	6 1 5	5.14E-06	8.	6.00E-06	-16.8	-4.55E-03	2.10E-03	1.88E-06
2216.23409	19.	8 2 7	7 1 6	1.08E-05	6.	1.04E-05	4.0	-6.00E-03	2.78E-03	1.63E-06
2220.80120	9.	9 1 8	8 2 7	5.50E-06	5.	5.25E-06	4.6	4.29E-03	-2.00E-03	6.78E-07
2222.04083	0.	9 0 9	8 1 8	1.47E-05	5.	1.45E-05	1.3	7.29E-03	-3.48E-03	7.82E-08
2222.28875	-10.	9 1 9	8 0 8	4.58E-06	3.	4.81E-06	-4.9	-4.21E-03	2.01E-03	0.00E+00
2237.98658	8.	10 0 10	9 1 9	2.45E-06	14.	2.33E-06	5.0	2.92E-03	-1.40E-03	4.72E-08
2238.10489	2.	10 1 10	9 0 9	6.85E-06	5.	6.93E-06	-1.2	-5.06E-03	2.43E-03	-4.83E-08
2238.26708	12.	10 2 9	9 1 8	2.35E-06	13.	2.39E-06	-1.7	-2.89E-03	1.35E-03	1.69E-07
*2271.73343	8.	6 6 1	5 5 0	9.33E-06	6.	7.58E-06	18.7	-4.67E-03	1.86E-03	5.50E-05
2372.14370	31.	6 3 4	5 0 5	1.33E-06	15.	1.13E-06	15.1	1.54E-03	-4.68E-04	-1.24E-05
2423.06790	-106.	9 3 6	8 2 7	4.42E-07	15.	4.02E-07	9.1	-8.72E-04	2.27E-04	1.17E-05

Computed frequencies ( $\text{cm}^{-1}$ ) derived from energy levels given in ref. 1 for the (010) state and Table 1 for the upper state. o-c, observed minus computed  $\times 10^5$

(o-c)t<sub>s</sub>, observed minus computed line strengths given in percent. Computed values are derived from constants obtained in this work.

Z(020), Z(100), Z(001) are the contributions of the three states from which the computed strengths are derived:

$$S(\text{calc.}) = [Z(020) + Z(100) + Z(001)]^2$$

**Table 7. Observed and computed line strengths (cm<sup>-2</sup>/atm. at 296K) of the (001)-(010) band of H<sub>2</sub><sup>16</sup>O**

observed frequency	o-c	upper J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)%	Z(001)	Z(100)	Z(020)
1876.27753	93.	9	3	7	10	3	8	5.43E-07	15.	4.99E-07	8.1	6.69E-04	5.86E-05	-2.09E-05
1913.30647	-92.	9	2	8	10	2	9	1.29E-06	35.	1.13E-06	12.0	1.06E-03	9.78E-06	-2.92E-06
1913.61161	28.	5	2	4	5	4	1	1.74E-06	15.	1.74E-06	-3.	-3.97E-04	-2.00E-03	1.08E-03
1919.23048	-10.	6	4	2	7	4	3	3.52E-06	28.	3.46E-06	1.7	1.75E-03	2.32E-04	-1.22E-04
1935.34344	9.	8	2	7	9	2	8	1.20E-06	4.	1.01E-06	15.8	9.92E-04	1.82E-05	-5.11E-06
1936.222360	74.	8	1	7	9	1	8	2.70E-06	15.	3.02E-06	-12.0	1.74E-03	-4.02E-06	4.85E-06
1936.86250	160.	10	1	10	11	1	11	3.50E-07	15.	4.13E-07	-17.9	6.42E-04	4.88E-07	1.28E-07
1936.87540	82.	10	0	10	11	0	11	1.14E-06	15.	1.24E-06	-8.8	1.11E-03	5.61E-07	-3.74E-07
1946.89060	4.	5	4	2	6	4	3	5.50E-06	9.	5.79E-06	-5.2	2.32E-03	2.15E-04	-1.32E-04
1947.28000	-26.	6	3	4	7	3	5	2.42E-06	5.	2.51E-06	-3.5	1.36E-03	3.61E-04	-1.41E-04
1956.30898	1.	9	1	9	10	1	10	3.30E-06	10.	3.24E-06	1.7	1.80E-03	1.54E-06	-6.34E-07
1956.33015	50.	9	0	9	10	0	10	1.08E-06	10.	1.08E-06	-1.	1.04E-03	6.55E-07	0.00E+00
1957.18703	14.	7	2	6	8	2	7	7.09E-06	5.	7.25E-06	-2.2	2.62E-03	1.09E-04	-3.44E-05
1958.10675	-4.	6	2	4	7	2	5	1.01E-05	4.	9.68E-06	4.2	3.18E-03	-1.28E-04	6.10E-05
1958.61650	-15.	7	1	6	8	1	7	2.20E-06	10.	2.41E-06	-9.7	1.56E-03	-9.84E-06	7.73E-06
1965.56288	-1.	5	3	2	6	3	3	3.15E-06	7.	3.60E-06	-14.3	1.53E-03	6.08E-04	-2.44E-04
1971.34370	-76.	4	1	4	4	3	1	5.74E-07	15.	6.39E-07	-11.2	-3.35E-04	-9.87E-04	5.22E-04
1972.59250	6.	5	3	3	6	3	4	1.29E-05	3.	1.37E-05	-5.8	3.24E-03	7.71E-04	-3.16E-04
1972.98878	29.	4	4	0	5	4	1	6.98E-06	6.	6.47E-06	7.4	2.52E-03	1.34E-04	-1.07E-04
1973.12208	50.	4	4	1	5	4	2	1.88E-06	15.	2.16E-06	-14.7	1.45E-03	7.78E-05	-6.20E-05
1975.77075	73.	8	1	8	9	1	9	2.72E-06	12.	2.57E-06	5.7	1.60E-03	2.15E-06	-4.46E-07
1975.80807	40.	8	0	8	9	0	9	8.14E-06	7.	7.71E-06	5.3	2.77E-03	1.86E-06	6.67E-08
1978.02355	-2.	6	2	5	7	2	6	4.80E-06	11.	4.83E-06	-6.	2.00E-03	2.97E-04	-1.02E-04
1981.02682	1.	6	1	5	7	1	6	1.58E-05	6.	1.57E-05	-8.	3.97E-03	-4.73E-05	3.09E-05
1984.78070	37.	5	2	3	6	2	4	6.84E-06	5.	6.83E-06	-2.	2.67E-03	-1.06E-04	4.69E-05
*1986.33413	54.	7	7	1	7	7	0	1.12E-06	37.	1.14E-06	-2.2	1.08E-03	-2.88E-05	2.16E-05
1994.10910	-108.	8	1	7	8	3	6	6.17E-07	15.	5.40E-07	12.5	-6.59E-04	-9.31E-05	1.70E-05
1995.24558	14.	7	1	7	8	1	8	1.67E-05	2.	1.66E-05	-8.	4.06E-03	9.52E-06	-2.02E-06
1995.31042	-10.	7	0	7	8	0	8	5.80E-06	6.	5.52E-06	4.8	2.35E-03	1.46E-06	4.44E-07
1995.96922	14.	4	3	1	5	3	2	1.86E-05	2.	1.96E-05	-5.4	4.04E-03	6.95E-04	-3.04E-04
2001.08569	-6.	6	3	3	5	5	0	1.02E-05	2.	1.02E-05	-1.	-1.12E-04	-2.28E-04	3.54E-03
2003.63545	-9.	5	1	4	6	1	5	9.63E-06	4.	1.03E-05	-6.6	3.22E-03	-5.39E-05	3.22E-05
2004.18785	8.	5	2	4	6	2	5	1.96E-05	5.	2.03E-05	-3.4	4.89E-03	-5.86E-04	2.00E-04
2012.15415	30.	4	2	2	5	2	3	3.61E-05	2.	3.67E-05	-1.7	6.18E-03	-2.03E-04	8.15E-05
2014.23510	121.	7	0	7	7	2	6	4.44E-07	15.	4.52E-07	-1.8	-6.24E-04	-5.84E-05	9.95E-06
2014.72844	27.	6	1	6	7	1	7	1.05E-05	6.	1.07E-05	-1.7	3.26E-03	1.58E-05	-4.20E-06
2014.83462	30.	6	0	6	7	0	7	3.21E-05	5.	3.20E-05	-2.	5.66E-03	1.80E-06	2.60E-06
2019.04610	132.	6	1	5	6	3	4	2.20E-06	15.	1.89E-06	14.1	-1.27E-03	-1.69E-04	6.36E-05
2021.26990	78.	8	6	2	8	6	3	5.62E-07	15.	6.12E-07	-8.9	7.47E-04	1.30E-05	2.22E-05
2022.98790	-42.	4	1	3	4	3	2	1.48E-06	15.	1.69E-06	-14.3	-1.22E-03	-1.99E-04	1.15E-04
2023.18305	99.	7	1	7	7	1	6	1.52E-06	15.	1.50E-06	1.5	1.10E-03	1.64E-04	-4.02E-05
2023.62880	62.	7	6	2	7	6	1	1.90E-06	6.	1.75E-06	7.8	1.30E-03	-7.36E-06	3.11E-05
2023.63910	70.	7	6	1	7	6	2	5.98E-07	15.	5.84E-07	2.4	7.50E-04	-4.24E-06	1.79E-05
2024.38910	-6.	3	3	0	4	3	1	7.04E-06	6.	7.17E-06	-1.8	2.66E-03	7.48E-05	-5.68E-05
2025.25415	-7.	3	3	1	4	3	2	2.15E-05	4.	2.16E-05	-5.	4.62E-03	1.34E-04	-1.01E-04
*2025.89082	30.	6	6	0	6	6	1	6.60E-06	10.	6.06E-06	8.2	2.47E-03	-5.39E-05	4.17E-05
2025.89976	25.	4	2	3	5	2	4	1.34E-05	14.	1.34E-05	.1	3.78E-03	-1.82E-04	5.89E-05
2026.94092	-6.	4	1	3	5	1	4	4.95E-05	8.	5.38E-05	-8.6	7.39E-03	-1.33E-04	7.60E-05
2034.14260	8.	5	1	5	6	1	6	5.56E-05	4.	5.56E-05	.0	7.38E-03	1.18E-04	-3.74E-05
2034.19130	14.	6	0	6	6	2	5	2.86E-06	10.	2.85E-06	.5	-1.57E-03	-1.51E-04	3.91E-05
2034.36267	-12.	5	0	5	6	0	6	1.87E-05	5.	1.85E-05	1.0	4.30E-03	-2.55E-06	4.01E-06
2035.87470	7.	5	2	4	4	4	1	3.10E-07	15.	2.59E-07	16.5	-2.25E-04	-6.62E-04	3.78E-04
2036.00710	36.	1	0	1	2	2	0	3.66E-07	15.	4.32E-07	-18.0	6.47E-04	2.95E-05	-1.89E-05
2040.01669	-3.	3	2	1	4	2	2	1.63E-05	3.	1.77E-05	-8.4	4.25E-03	-7.22E-05	2.18E-05
2048.64945	-3.	3	2	2	4	2	3	5.60E-05	4.	5.60E-05	-1.	7.58E-03	-1.18E-04	2.17E-05
2051.39235	-8.	3	1	2	4	1	3	2.68E-05	3.	2.72E-05	-1.6	5.25E-03	-7.81E-05	4.31E-05
2051.98980	-84.	5	0	5	5	2	4	1.85E-06	10.	1.71E-06	7.4	-1.23E-03	-1.16E-04	3.61E-05
2053.86439	0.	4	0	4	5	0	5	8.47E-05	3.	8.60E-05	-1.5	9.28E-03	-2.22E-05	1.71E-05
2054.43245	3.	4	1	4	5	1	5	2.61E-05	2.	2.62E-05	-2.	5.22E-03	-1.52E-04	5.17E-05
2058.49498	-3.	7	5	3	7	5	2	2.78E-06	15.	3.09E-06	-11.3	1.65E-03	8.94E-05	2.01E-05
2059.76090	71.	7	2	6	7	2	5	2.91E-06	15.	3.14E-06	-7.9	1.27E-03	8.09E-04	-3.10E-04
2060.64657	-10.	6	5	2	6	5	1	2.60E-06	7.	2.63E-06	-1.2	1.58E-03	2.23E-05	2.16E-05
2060.71595	-2.	6	5	1	6	5	2	7.69E-06	6.	7.89E-06	-2.6	2.73E-03	3.87E-05	3.73E-05
2062.55039	19.	5	5	1	5	5	0	1.80E-05	5.	1.84E-05	-2.0	4.30E-03	-7.53E-05	5.87E-05
2062.55690	4.	5	5	0	5	5	1	5.97E-06	3.	6.13E-06	-2.7	2.49E-03	-4.35E-05	3.39E-05
2066.61470	10.	4	0	4	4	2	3	7.56E-06	4.	7.35E-06	2.8	-2.58E-03	-2.12E-04	7.82E-05
2067.77917	11.	2	2	0	3	2	1	5.24E-05	3.	5.26E-05	-3.	7.23E-03	7.07E-05	-5.14E-05
2071.95009	-10.	2	2	1	3	2	2	1.78E-05	3.	1.79E-05	-8.	4.22E-03	5.43E-05	-3.77E-05
2073.37822	3.	3	0	3	4	0	4	3.86E-05	5.	3.92E-05	-1.5	6.27E-03	-2.93E-05	1.85E-05
2073.99122	2.	3	1	3	4	1	4	1.10E-04	3.	1.11E-04	-8.	1.06E-02	-7.74E-05	2.40E-05
2076.03280	0.	5	1	5	5	1	4	1.10E-05	8.	1.02E-05	7.1	2.40E-03	1.37E-03	-5.74E-04
2076.97192	8.	2	1	1	3	1	2	1.01E-04	2.	1.01E-04	-2.2	1.01E-02	-8.45E-05	4.54E-05
2082.90739	5.	2	0	2	2	2	1	3.60E-06	10.	3.53E-06	2.0	-1.86E-03	-5.01E-05	3.22E-05
2085.37290	4.	6	2	5	6	2	4	4.90E-06	10.	4.70E-06	4.1	1.12E-03	1.82E-03	-7.79E-04
2086.83550	-6.	7	4	4	7	4	3	4.50E-06	12.	4.61E-06	-2.4	1.82E-03	4.24E-04	-9.44E-05
2090.39830	6.	7	3	5	7	3	4	5.93E-06	6.	5.75E-06	3.0	1.52E-03	1.40E-03	-5.28E-04

Table 7 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	computed strength	t <sub>s</sub>	(o-c)t <sub>s</sub>	Z(001)	Z(100)	Z(020)
2090.89849	7.	6 4 3	6 4 2	3.39E-06	5.	3.86E-06	-13.9	1.77E-03	2.34E-04	-4.40E-05
2092.98835	8.	6 4 2	6 4 3	1.16E-05	3.	1.16E-05	-1.	3.07E-03	4.25E-04	-8.46E-05
2093.31628	-1.	2 0 2	3 0 3	1.38E-04	3.	1.39E-04	-1.0	1.18E-02	-6.57E-05	3.91E-05
2093.40956	2.	5 4 2	5 4 1	2.67E-05	3.	2.64E-05	1.3	4.91E-03	2.46E-04	-2.16E-05
2093.64324	53.	7 4 3	7 4 4	1.37E-06	10.	1.56E-06	-14.2	1.04E-03	2.81E-04	-6.97E-05
2093.86395	16.	5 4 1	5 4 2	9.14E-06	12.	8.80E-06	3.7	2.84E-03	1.44E-04	-1.34E-05
2094.09290	-4.	2 1 2	3 1 3	4.04E-05	3.	4.11E-05	-1.7	6.42E-03	-5.60E-06	-2.83E-06
2095.19829	4.	4 4 1	4 4 0	1.87E-05	5.	1.85E-05	1.2	4.31E-03	-5.92E-05	4.54E-05
2095.25185	6.	4 4 0	4 4 1	5.51E-05	3.	5.53E-05	-4.	7.46E-03	-1.02E-04	7.85E-05
2097.10575	-5.	8 4 4	8 4 5	1.61E-06	16.	1.75E-06	-8.9	9.67E-04	5.06E-04	-1.49E-04
2103.33174	8.	1 1 0	2 1 1	2.94E-05	6.	2.97E-05	-1.0	5.45E-03	0.00E+00	0.00E+00
2104.64520	8.	6 3 4	6 3 3	5.30E-06	12.	5.07E-06	4.3	1.49E-03	1.23E-03	-4.67E-04
2111.50610	95.	5 2 4	5 2 3	2.57E-06	15.	2.20E-06	14.5	3.33E-03	-3.45E-03	1.60E-03
2113.81043	6.	5 3 3	5 3 2	3.33E-05	1.	3.34E-05	-2.	4.24E-03	2.46E-03	-9.26E-04
2114.52861	9.	1 0 1	2 0 2	4.48E-05	3.	4.51E-05	-6.	6.72E-03	-2.42E-05	1.42E-05
2114.63961	13.	1 1 1	2 1 2	9.85E-05	3.	9.83E-05	.2	9.90E-03	4.71E-05	-3.01E-05
2119.23174	12.	4 3 2	4 3 1	2.05E-05	3.	2.17E-05	-5.8	3.96E-03	1.10E-03	-4.05E-04
2120.18510	-316.	4 1 3	3 3 0	4.68E-07	15.	3.88E-07	17.1	-6.50E-04	2.45E-06	2.42E-05
2121.64782	13.	4 3 1	4 3 2	6.47E-05	2.	6.48E-05	-.2	6.66E-03	2.22E-03	-8.31E-04
2121.74485	8.	5 3 2	5 3 3	1.04E-05	5.	1.09E-05	-4.6	2.04E-03	2.07E-03	-8.05E-04
2122.45414	-2.	3 3 1	3 3 0	1.20E-04	3.	1.18E-04	1.4	1.09E-02	-1.13E-04	8.32E-05
2122.85480	2.	3 3 0	3 3 1	3.98E-05	4.	3.95E-05	.8	6.30E-03	-6.36E-05	4.72E-05
2123.17464	13.	3 1 3	3 1 2	2.01E-05	3.	2.11E-05	-5.2	5.01E-03	-8.41E-04	4.29E-04
2127.15135	28.	4 2 3	4 2 2	7.05E-06	4.	7.17E-06	-1.7	3.24E-03	-1.08E-03	5.19E-04
2137.33075	7.	3 2 2	3 2 1	6.60E-05	4.	6.66E-05	-.9	8.68E-03	-1.03E-03	5.10E-04
2137.37165	13.	0 0 0	1 0 1	9.10E-05	3.	8.88E-05	2.4	9.42E-03	0.00E+00	0.00E+00
2139.92689	20.	2 1 2	2 1 1	1.61E-05	4.	1.67E-05	-4.0	4.20E-03	-2.23E-04	1.20E-04
2142.25134	-8.	2 2 1	2 2 0	5.67E-05	6.	5.53E-05	2.4	7.46E-03	-5.45E-05	3.74E-05
2143.98110	-116.	5 1 4	4 3 1	3.01E-07	15.	3.41E-07	-13.4	-6.28E-04	3.96E-05	4.66E-06
2144.80871	19.	2 2 0	2 2 1	1.67E-04	1.	1.66E-04	.3	1.29E-02	-7.69E-05	5.50E-05
2146.72920	37.	7 3 4	7 3 5	3.66E-07	15.	4.38E-07	-19.7	9.77E-04	-6.06E-04	2.91E-04
2149.12983	-41.	3 2 1	3 2 2	2.56E-05	5.	2.36E-05	7.7	5.07E-03	-4.23E-04	2.14E-04
2151.19511	5.	1 1 1	1 1 0	1.25E-04	2.	1.25E-04	.3	1.12E-02	-5.19E-05	3.35E-05
2153.24110	-110.	5 0 5	4 2 2	4.25E-07	15.	4.06E-07	4.6	-7.31E-04	1.33E-04	-3.85E-05
2155.29596	16.	4 0 4	3 2 1	2.33E-06	9.	1.97E-06	15.3	-1.57E-03	2.49E-04	-7.96E-05
2158.10631	10.	4 2 2	4 2 3	2.86E-05	3.	3.01E-05	-5.3	5.89E-03	-8.26E-04	4.22E-04
2162.01461	10.	1 1 0	1 1 1	4.36E-05	4.	4.35E-05	.2	6.60E-03	0.00E+00	0.00E+00
2171.81845	17.	5 2 3	5 2 4	4.38E-06	10.	4.31E-06	1.6	2.25E-03	-3.69E-04	1.95E-04
2172.32391	0.	2 1 1	2 1 2	6.00E-05	2.	5.86E-05	2.3	7.74E-03	-1.74E-04	9.13E-05
2184.74685	8.	1 0 1	0 0 0	3.68E-05	4.	3.66E-05	.6	6.03E-03	3.33E-05	-1.96E-05
2187.37853	13.	3 1 2	3 1 3	1.06E-05	4.	1.04E-05	2.0	3.29E-03	-1.32E-04	6.94E-05
2189.41334	7.	6 2 4	6 2 5	5.26E-06	21.	5.65E-06	-7.4	2.56E-03	-4.10E-04	2.26E-04
2198.60965	11.	2 1 2	1 1 1	4.85E-05	1.	4.75E-05	2.0	6.80E-03	1.72E-04	-8.32E-05
2206.20725	6.	4 1 3	4 1 4	1.82E-05	3.	1.77E-05	2.6	4.30E-03	-1.93E-04	1.02E-04
2206.65612	30.	2 0 2	1 0 1	2.01E-04	5.	1.98E-04	1.5	1.40E-02	8.07E-05	-4.82E-05
2207.38549	3.	6 5 2	5 5 1	1.26E-06	24.	1.17E-06	7.5	1.25E-03	-2.64E-04	9.05E-05
2207.43048	33.	6 5 1	5 5 0	3.96E-06	11.	3.48E-06	12.1	2.17E-03	-4.57E-04	1.57E-04
2208.87953	4.	2 1 1	1 1 0	1.42E-04	3.	1.40E-04	1.5	1.17E-02	2.57E-04	-1.36E-04
2214.36022	8.	3 2 2	2 2 1	1.10E-04	3..	1.11E-04	-1.2	9.75E-03	1.43E-03	-6.33E-04
2215.67292	8.	5 4 2	4 4 1	1.18E-05	5.	1.17E-05	1.1	4.10E-03	-1.07E-03	3.90E-04
2215.94092	46.	5 4 1	4 4 0	3.76E-06	15.	3.89E-06	-3.6	2.37E-03	-6.21E-04	2.26E-04
2217.69779	55.	4 3 2	3 3 1	5.30E-06	15.	4.33E-06	18.2	3.66E-03	-2.62E-03	1.04E-03
2218.52682	24.	3 1 3	2 1 2	2.17E-04	2.	2.15E-04	1.0	1.44E-02	4.95E-04	-2.28E-04
2218.84769	6.	4 3 1	3 3 0	8.87E-06	6.	9.06E-06	-2.2	6.14E-03	-5.21E-03	2.08E-03
2219.43155	8.	3 2 1	2 2 0	3.55E-05	1.	3.56E-05	-.3	5.63E-03	6.14E-04	-2.77E-04
2220.77330	10.	2 2 1	2 0 2	1.55E-06	36.	1.46E-06	5.9	-1.18E-03	-7.82E-05	4.97E-05
2224.76934	25.	3 2 2	3 0 3	9.23E-06	5.	8.91E-06	3.4	-2.97E-03	-8.58E-05	7.54E-05
2225.86483	4.	3 0 3	2 0 2	7.87E-05	3.	7.94E-05	-.9	8.90E-03	3.36E-05	-2.24E-05
2229.80512	25.	7 5 3	6 5 2	2.75E-06	12.	3.21E-06	-16.6	2.10E-03	-4.66E-04	1.61E-04
2229.89659	16.	8 2 6	8 2 7	1.17E-06	24.	1.07E-06	8.5	1.08E-03	-1.14E-04	7.18E-05
2230.04001	-35.	7 5 2	6 5 1	9.33E-07	15.	1.07E-06	-14.2	1.21E-03	-2.69E-04	9.34E-05
2232.60130	30.	4 2 3	4 0 4	3.10E-06	20.	3.18E-06	-2.7	-1.82E-03	2.72E-05	1.35E-05
2233.21245	30.	3 1 2	2 1 1	6.64E-05	2.	6.61E-05	.5	8.05E-03	1.69E-04	-9.17E-05
2236.26472	13.	4 2 3	3 2 2	4.95E-05	2.	4.93E-05	.4	6.37E-03	1.14E-03	-4.92E-04
2237.77784	7.	4 1 4	3 1 3	7.93E-05	3.	7.86E-05	.9	8.43E-03	7.53E-04	-3.21E-04
2239.48908	10.	5 3 3	4 3 2	1.67E-05	4.	1.55E-05	7.5	6.55E-03	-4.32E-03	1.71E-03
2239.50732	7.	6 4 2	5 4 1	1.14E-05	4.	1.16E-05	-1.9	4.16E-03	-1.18E-03	4.32E-04
2242.73435	14.	4 0 4	3 0 3	2.35E-04	2.	2.32E-04	1.1	1.53E-02	0.00E+00	-1.74E-05
2243.44210	46.	5 3 3	5 1 4	3.06E-06	15.	2.71E-06	11.6	-1.41E-03	-3.75E-04	1.45E-04
2244.70750	20.	5 2 4	5 0 5	6.83E-06	11.	6.18E-06	9.4	-2.69E-03	2.42E-04	-4.38E-05
2246.78750	9.	4 2 2	3 2 1	1.36E-04	3.	1.35E-04	1.1	1.11E-02	9.35E-04	-4.28E-04
2248.00359	-11.	6 1 5	6 1 6	6.34E-06	6.	5.83E-06	8.1	2.44E-03	-5.99E-05	3.22E-05
2252.87743	39.	8 5 3	7 5 2	1.79E-06	5.	1.97E-06	-10.2	1.66E-03	-3.87E-04	1.33E-04
2255.29926	25.	5 1 5	4 1 4	1.86E-04	2.	1.82E-04	1.9	1.39E-02	-5.64E-04	2.14E-04
2255.39045	-5.	4 1 3	3 1 2	1.93E-04	2.	1.93E-04	.0	1.38E-02	2.50E-04	-1.39E-04
2257.45752	1.	5 2 4	4 2 3	1.39E-04	2.	1.37E-04	1.3	9.94E-03	3.02E-03	-1.25E-03
2258.69215	2.	5 0 5	4 0 4	6.71E-05	3.	6.60E-05	1.7	8.14E-03	-1.31E-05	-1.47E-06

Table 7 continued

observed frequency	upper o-c	J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(001)	Z(100)	Z(020)
2260.59320	-5.	7	4	4	6	4	3	8.00E-06	12.	8.16E-06	-2.0	3.49E-03	-9.95E-04	3.59E-04
2260.82700	0.	6	3	4	5	3	3	5.17E-06	18.	5.08E-06	1.7	3.38E-03	-1.83E-03	7.06E-04
2263.98540	20.	7	4	3	6	4	2	2.78E-06	15.	2.53E-06	9.2	1.99E-03	-6.26E-04	2.28E-04
2266.38310	91.	7	4	4	7	2	5	4.25E-07	15.	4.17E-07	2.0	-5.61E-04	-1.55E-04	7.11E-05
2267.88160	77.	7	1	6	7	1	7	9.68E-07	15.	1.03E-06	-6.1	1.02E-03	-1.37E-05	7.52E-06
2272.41070	-11.	6	2	5	5	2	4	1.62E-05	3.	1.54E-05	4.7	4.80E-03	-1.41E-03	5.45E-04
2272.98912	13.	6	1	6	5	1	5	4.80E-05	5.	4.87E-05	-1.5	7.04E-03	-8.19E-05	2.56E-05
2273.06990	6.	5	2	3	4	2	2	3.76E-05	3.	3.87E-05	-3.0	6.02E-03	3.70E-04	-1.73E-04
2274.42960	0.	5	1	4	4	1	3	4.97E-05	2.	5.00E-05	-5.	7.03E-03	9.57E-05	-5.62E-05
2274.71082	13.	6	0	6	5	0	5	1.52E-04	1.	1.49E-04	1.8	1.22E-02	-3.08E-05	2.92E-06
2277.53460	8.	6	3	3	5	3	2	5.26E-05	5.	5.05E-05	4.0	5.43E-03	2.91E-03	-1.23E-03
2286.63587	-8.	8	1	7	8	1	8	1.37E-06	6.	1.50E-06	-9.6	1.23E-03	-8.14E-06	4.40E-06
2289.89414	16.	6	1	5	5	1	4	1.01E-04	2.	9.85E-05	2.5	9.90E-03	7.95E-05	-5.39E-05
2290.15915	20.	7	1	7	6	1	6	9.86E-05	4.	9.91E-05	-5.	1.00E-02	-5.68E-05	1.31E-05
2290.99335	.7.	7	0	7	6	0	6	3.24E-05	1.	3.34E-05	-3.2	5.80E-03	-1.49E-05	1.30E-06
2291.06688	21.	7	2	6	6	2	5	4.89E-05	2.	4.74E-05	3.0	7.24E-03	-5.41E-04	1.88E-04
2296.73070	5.	6	2	4	5	2	3	7.86E-05	3.	7.90E-05	-5.	8.69E-03	3.85E-04	-1.86E-04
2297.95261	-64.	3	2	1	2	0	2	4.63E-06	12.	3.92E-06	15.4	1.97E-03	6.61E-05	-5.65E-05
2304.09411	42.	7	3	4	6	3	3	1.12E-05	10.	1.09E-05	2.7	2.90E-03	6.83E-04	-2.80E-04
2307.39690	-16.	8	2	7	7	2	6	9.76E-06	11.	9.45E-06	3.2	3.14E-03	-9.93E-05	2.88E-05
2307.44775	14.	8	0	8	7	0	7	6.05E-05	2.	6.05E-05	-1.	7.80E-03	-1.81E-05	1.03E-06
2316.75860	-12.	7	2	5	6	2	4	1.43E-05	9.	1.48E-05	-3.1	3.78E-03	1.19E-04	-5.97E-05
2322.56993	3.	9	2	8	8	2	7	1.35E-05	15.	1.44E-05	-6.8	3.85E-03	-6.36E-05	1.31E-05
2323.78165	-11.	9	1	9	8	1	8	3.25E-05	4.	3.28E-05	-1.1	5.74E-03	-1.40E-05	4.37E-07
2323.96347	22.	9	0	9	8	0	8	1.14E-05	4.	1.10E-05	3.9	3.32E-03	-6.64E-06	9.09E-08
2373.27780	23.	12	0	12	11	0	11	3.48E-06	15.	2.89E-06	16.9	1.70E-03	-2.10E-06	-1.80E-07
2389.53250	42.	13	1	13	12	1	12	1.30E-06	15.	1.07E-06	17.8	1.03E-03	-1.01E-06	4.98E-08
2407.16620	41.	6	3	3	5	1	4	4.22E-06	15.	4.15E-06	1.6	2.21E-03	-1.36E-04	-3.45E-05
2411.03020	90.	4	4	1	3	2	2	3.94E-07	15.	3.99E-07	-1.3	5.81E-04	1.35E-04	-8.41E-05
2429.93340	60.	6	2	4	5	0	5	4.76E-06	15.	4.19E-06	12.0	2.06E-03	7.94E-05	-9.63E-05
2437.25610	38.	5	4	2	4	2	3	2.00E-06	15.	1.97E-06	1.3	1.30E-03	2.77E-04	-1.68E-04
2437.40210	103.	6	4	2	5	2	3	2.82E-06	15.	2.78E-06	1.4	1.56E-03	2.64E-04	-1.52E-04
2440.41970	17.	7	3	4	6	1	5	1.16E-06	15.	1.28E-06	-10.6	1.19E-03	-1.84E-05	-4.05E-05
2451.96050	44.	7	4	3	6	2	4	9.64E-07	15.	8.91E-07	7.5	8.81E-04	1.36E-04	-7.28E-05
2463.87820	62.	5	5	1	4	3	2	7.14E-07	15.	5.90E-07	17.4	6.77E-04	2.21E-04	-1.30E-04
2464.40580	16.	6	3	4	5	1	5	7.92E-07	15.	7.07E-07	10.7	7.62E-04	1.54E-04	-7.42E-05
2469.21120	50.	8	4	4	7	2	5	2.00E-06	15.	1.96E-06	1.8	1.29E-03	2.03E-04	-9.36E-05
2482.61020	13.	8	3	5	7	1	6	2.05E-06	15.	1.92E-06	6.2	1.44E-03	2.34E-05	-7.19E-05
2497.68860	-7.	7	4	4	6	2	5	1.82E-06	15.	1.59E-06	12.7	1.17E-03	2.22E-04	-1.27E-04
2510.51950	-71.	7	3	5	6	1	6	1.38E-06	15.	1.43E-06	-3.4	1.10E-03	1.97E-04	-1.03E-04
2510.95040	51.	7	5	3	6	3	4	9.19E-07	15.	7.79E-07	15.2	7.97E-04	2.04E-04	-1.18E-04
2514.16810	-77.	8	5	3	7	3	4	7.25E-07	15.	6.25E-07	13.8	7.27E-04	1.48E-04	-8.38E-05
2530.67980	-38.	7	6	2	6	4	3	3.36E-07	15.	2.71E-07	19.2	4.48E-04	1.62E-04	-8.93E-05
2544.41920	-17.	8	2	6	7	0	7	8.28E-07	15.	9.33E-07	-12.6	9.64E-04	8.29E-05	-8.15E-05
2571.91000	-84.	9	4	6	8	2	7	5.02E-07	15.	4.92E-07	2.0	6.53E-04	1.10E-04	-6.20E-05

Computed frequencies ( $\text{cm}^{-1}$ ) derived from energy levels given in ref. 1 for the (010) state and Table 1 for the upper state. o-c, observed minus computed  $\times 10^5$

(o-c) $t_s$ , observed minus computed line strengths given in percent. Computed values are derived from constants obtained in this work.

Z(020), Z(100), Z(001) are the contributions of the three states from which the computed strengths are derived:

$$S(\text{calc.}) = [Z(020) + Z(100) + Z(001)]^2$$

**Table 8. Observed and computed line strengths (cm<sup>-2</sup>/atm. at 296K) of the (020)-(000) band of H<sub>2</sub><sup>16</sup>O**

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	ts	computed strength	(o-c)%	Z(020)	Z(100)	Z(001)
2622.57530	-14.	9 0 9	10 3 8	3.10E-06	10.	2.38E-06	23.1	9.46E-04	7.16E-04	-1.19E-04
2670.00440	-4.	10 2 9	11 3 8	1.86E-06	5.	1.70E-06	8.8	-8.21E-04	-5.93E-04	1.12E-04
2681.81480	45.	9 1 8	10 4 7	3.56E-06	7.	2.69E-06	24.3	9.49E-04	8.07E-04	-1.14E-04
2693.33180	43.	8 1 8	9 2 7	1.35E-05	4.	1.17E-05	13.0	-2.26E-03	-1.38E-03	2.07E-04
2730.08900	-227.	9 2 8	10 3 7	3.60E-06	10.	2.99E-06	17.1	-1.14E-03	-7.04E-04	1.16E-04
2732.49271	-43.	7 0 7	8 3 6	2.68E-05	4.	2.56E-05	4.7	3.29E-03	2.00E-03	-2.32E-04
2788.81420	-3.	8 2 7	9 3 6	5.04E-05	8.	4.41E-05	12.4	-4.53E-03	-2.46E-03	3.39E-04
2819.44924	18.	6 1 6	7 2 5	1.66E-04	3.	1.65E-04	.3	-9.03E-03	-4.27E-03	4.37E-04
2820.48697	-25.	9 3 7	10 4 6	1.00E-05	10.	9.21E-06	7.9	-2.03E-03	-1.17E-03	1.63E-04
2830.00743	-35.	5 0 5	6 3 4	1.36E-04	3.	1.26E-04	7.6	7.54E-03	3.92E-03	-2.59E-04
2844.01050	48.	7 2 6	8 3 5	7.10E-05	4.	6.64E-05	6.5	-5.67E-03	-2.78E-03	3.06E-04
2864.35029	-78.	8 3 6	9 4 5	1.31E-04	3.	1.31E-04	.1	-7.75E-03	-4.15E-03	4.59E-04
2871.33050	77.	4 0 4	5 3 3	6.00E-05	10.	5.68E-05	5.3	5.13E-03	2.51E-03	-1.05E-04
2879.70636	-34.	5 1 5	6 2 4	1.98E-04	5.	1.93E-04	2.5	-9.98E-03	-4.24E-03	3.27E-04
2890.16270	17.	12 0 12	13 1 13	3.45E-05	7.	3.41E-05	1.1	-4.24E-03	-1.60E-03	4.79E-06
2890.19489	-37.	12 1 12	13 0 13	1.10E-04	6.	1.02E-04	6.9	7.35E-03	2.78E-03	-8.15E-06
2893.07588	-5.	9 4 5	10 5 6	5.55E-05	2.	5.33E-05	4.0	-4.72E-03	-2.87E-03	2.95E-04
2893.81418	0.	6 2 5	7 3 4	8.11E-04	2.	7.97E-04	1.7	-2.00E-02	-8.99E-03	7.42E-04
2904.43818	28.	8 4 5	9 5 4	1.74E-04	2.	1.61E-04	7.2	-8.19E-03	-4.95E-03	4.28E-04
2906.72554	-11.	3 0 3	4 3 2	1.45E-04	2.	1.37E-04	5.8	8.00E-03	3.75E-03	-6.62E-05
2909.43500	-73.	11 3 8	12 4 9	9.70E-06	10.	8.33E-06	14.1	-1.92E-03	-1.06E-03	9.53E-05
2909.68935	32.	9 5 4	10 6 5	4.10E-05	4.	3.35E-05	18.4	-3.38E-03	-2.63E-03	2.25E-04
2911.33232	5.	8 4 4	9 5 5	4.75E-05	3.	3.75E-05	21.0	-3.94E-03	-2.42E-03	2.32E-04
2911.88958	13.	11 0 11	12 1 12	2.94E-04	3.	3.02E-04	-2.7	-1.26E-02	-4.74E-03	1.33E-05
2911.95194	-5.	11 1 11	12 0 12	9.90E-05	5.	1.01E-04	-1.8	7.31E-03	2.74E-03	-7.46E-06
2912.46818	-5.	9 3 6	10 4 7	8.70E-05	2.	8.55E-05	1.8	-6.33E-03	-3.21E-03	2.98E-04
2918.99160	9.	8 3 5	9 4 6	8.57E-05	2.	8.43E-05	1.6	-6.32E-03	-3.12E-03	2.65E-04
2922.11430	9.	12 1 12	12 2 11	1.54E-05	10.	1.51E-05	2.1	2.91E-03	9.58E-04	1.57E-05
2924.25910	-20.	12 1 11	13 2 12	1.00E-05	6.	9.13E-06	8.7	-2.10E-03	-9.32E-04	8.82E-06
2930.12835	2.	7 3 4	8 4 5	7.16E-04	2.	6.98E-04	2.5	-1.82E-02	-8.81E-03	6.38E-04
2930.65783	-4.	7 4 4	8 5 3	1.76E-04	2.	1.65E-04	6.4	-8.29E-03	-4.86E-03	3.12E-04
2932.65156	-15.	8 5 4	9 6 3	1.27E-04	3.	1.10E-04	13.7	-6.09E-03	-4.68E-03	3.00E-04
2933.12130	12.	8 5 3	9 6 4	4.10E-05	4.	3.64E-05	11.3	-3.52E-03	-2.68E-03	1.71E-04
2933.35685	-2.	10 1 10	11 0 11	8.28E-04	3.	8.12E-04	1.9	2.08E-02	7.71E-03	-1.93E-05
2933.72895	1.	6 3 4	7 4 3	1.53E-03	3.	1.54E-03	-.5	-2.70E-02	-1.30E-02	7.96E-04
2934.02800	-240.	12 2 10	13 3 11	4.10E-06	10.	3.71E-06	9.6	-9.17E-04	-9.31E-04	-7.75E-05
2935.19362	5.	4 1 4	5 2 3	1.92E-03	2.	1.89E-03	1.5	-3.18E-02	-1.24E-02	6.54E-04
2936.74160	-23.	2 0 2	3 3 1	1.72E-05	4.	1.62E-05	5.9	2.77E-03	1.26E-03	0.00E+00
2936.96703	-3.	5 2 4	6 3 3	8.90E-04	2.	8.90E-04	0.	-2.14E-02	-8.99E-03	5.15E-04
2940.06758	1.	11 1 10	12 2 11	8.87E-05	2.	8.70E-05	1.9	-6.53E-03	-2.83E-03	2.72E-05
2941.76294	3.	11 2 10	12 1 11	3.02E-05	5.	2.93E-05	3.1	3.78E-03	1.64E-03	-1.21E-05
2943.14640	-12.	11 2 9	12 3 10	2.77E-05	5.	2.72E-05	1.8	-3.51E-03	-1.77E-03	5.72E-05
2944.66060	19.	11 1 11	11 2 10	1.74E-05	3.	1.68E-05	3.6	3.08E-03	9.97E-04	1.62E-05
2946.04970	-6.	6 3 3	7 4 4	5.95E-04	4.	5.89E-04	1.1	-1.68E-02	-7.92E-03	4.48E-04
2949.14830	4.	10 2 8	11 3 9	2.66E-05	5.	2.61E-05	1.7	-3.52E-03	-1.66E-03	6.96E-05
2953.41383	-1.	9 2 7	10 3 8	2.04E-04	2.	2.07E-04	-1.2	-1.00E-02	-4.54E-03	2.18E-04
2954.15386	5.	9 0 9	10 1 10	1.93E-03	2.	1.97E-03	-2.2	-3.26E-02	-1.19E-02	3.04E-05
2954.39855	-20.	9 1 9	10 0 10	6.81E-04	3.	6.57E-04	3.5	1.88E-02	6.86E-03	-1.56E-05
2955.25618	-2.	10 1 9	11 2 10	8.40E-05	3.	8.30E-05	1.2	-6.43E-03	-2.71E-03	2.77E-05
2955.67958	2.	6 4 3	7 5 2	1.36E-03	2.	1.30E-03	4.7	-2.33E-02	-1.33E-02	5.74E-04
2956.40613	3.	6 4 2	7 5 3	4.62E-04	3.	4.36E-04	5.7	-1.35E-02	-7.68E-03	3.32E-04
2956.90400	-1.	7 5 3	8 6 2	1.22E-04	3.	1.05E-04	13.6	-5.99E-03	-4.47E-03	1.96E-04
2956.99441	16.	8 2 6	9 3 7	1.65E-04	2.	1.68E-04	-1.5	-9.18E-03	-3.97E-03	2.07E-04
2957.02575	26.	7 5 2	8 6 3	3.85E-04	4.	3.16E-04	18.0	-1.04E-02	-7.71E-03	3.33E-04
2958.37995	3.	10 2 9	11 1 10	2.51E-04	2.	2.52E-04	-.5	1.12E-02	4.73E-03	-2.95E-05
2961.37252	2.	7 2 5	8 3 6	1.13E-03	2.	1.14E-03	-.9	-2.41E-02	-1.01E-02	5.34E-04
2961.71263	-5.	5 3 3	6 4 2	1.29E-03	2.	1.28E-03	.8	-2.47E-02	-1.15E-02	4.60E-04
2961.88288	46.	11 3 9	12 2 10	9.91E-06	10.	9.95E-06	-.4	2.07E-03	1.09E-03	-5.59E-06
2964.21697	13.	8 6 3	9 7 2	7.22E-05	2.	5.65E-05	21.7	-3.75E-03	-3.91E-03	1.47E-04
2966.00630	10.	5 3 2	6 4 3	4.14E-03	2.	4.02E-03	3.0	-4.39E-02	-2.02E-02	7.85E-04
2966.83284	5.	10 1 10	10 2 9	1.53E-04	4.	1.53E-04	-.3	9.36E-03	2.97E-03	4.75E-05
2967.33362	6.	10 0 10	10 1 9	5.25E-05	3.	5.17E-05	1.6	5.44E-03	1.72E-03	2.61E-05
2967.98477	-11.	6 2 4	7 3 5	8.15E-04	2.	8.11E-04	.5	-2.05E-02	-8.37E-03	4.11E-04
2969.51627	-1.	9 1 8	10 2 9	6.50E-04	2.	6.40E-04	1.5	-1.80E-02	-7.38E-03	8.44E-05
2970.17440	-2.	5 0 5	5 3 2	6.75E-05	5.	5.79E-05	14.3	-4.72E-03	-2.60E-03	-2.87E-04
2973.25241	-1.	4 2 3	5 3 2	7.00E-03	4.	7.09E-03	-1.3	-6.08E-02	-2.42E-02	8.67E-04
2974.58888	-9.	8 0 8	9 1 9	1.43E-03	2.	1.44E-03	-.7	-2.80E-02	-1.00E-02	2.55E-05
2975.08458	5.	8 1 8	9 0 9	4.29E-03	5.	4.33E-03	-1.0	4.85E-02	1.74E-02	-3.44E-05
2975.22271	12.	9 2 8	10 1 9	2.16E-04	2.	2.19E-04	-1.3	1.05E-02	4.32E-03	-1.96E-05

Table 8 continued

observed frequency	o-c	upper J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t	Z(020)	Z(100)	Z(001)
2977.94343	-4.	5	2	3	6	3	4	4.95E-03	2.	4.90E-03	1.0	-5.07E-02	-2.01E-02	8.33E-04
2979.07153	14.	10	3	8	11	2	9	9.09E-05	2.	8.73E-05	4.0	6.29E-03	3.07E-03	-1.54E-05
2980.24024	2.	5	4	2	6	5	1	1.03E-03	2.	9.91E-04	3.8	-2.04E-02	-1.13E-02	2.56E-04
2980.38811	-3.	5	4	1	6	5	2	3.08E-03	2.	2.97E-03	3.4	-3.54E-02	-1.96E-02	4.42E-04
2981.14415	-9.	6	5	2	7	6	1	9.13E-04	2.	8.17E-04	10.5	-1.66E-02	-1.21E-02	1.17E-04
2981.17111	-8.	6	5	1	7	6	2	3.08E-04	3.	2.68E-04	12.9	-9.57E-03	-6.97E-03	1.59E-04
2982.45252	-1.	8	1	7	9	2	8	4.85E-04	2.	4.88E-04	-7.	-1.59E-02	-6.31E-03	8.55E-05
2984.21159	6.	3	1	3	4	2	2	1.88E-03	2.	1.85E-03	1.5	-3.19E-02	-1.14E-02	3.61E-04
2987.52481	-5.	4	3	2	5	4	1	8.06E-03	3.	8.06E-03	.0	-6.24E-02	-2.80E-02	5.74E-04
2988.19165	9.	7	6	2	8	7	1	7.13E-05	2.	5.47E-05	23.3	-3.66E-03	-3.82E-03	8.71E-05
2988.28775	-11.	7	6	1	8	7	2	2.08E-04	2.	1.60E-04	22.9	-6.28E-03	-6.43E-03	4.38E-05
2988.54570	20.	9	1	9	9	2	8	1.39E-04	2.	1.42E-04	-2.2	9.06E-03	2.82E-03	4.44E-05
2988.61258	-2.	4	3	1	5	4	2	2.74E-03	2.	2.71E-03	1.0	-3.62E-02	-1.62E-02	3.29E-04
2989.62427	16.	9	0	9	9	1	8	4.27E-04	2.	4.35E-04	-1.8	1.59E-02	4.91E-03	6.96E-05
2991.45528	-3.	4	0	4	4	3	1	3.17E-05	3.	2.89E-05	8.8	-3.54E-03	-1.68E-03	-1.60E-04
2991.97100	-10.	4	2	2	5	3	3	3.08E-03	2.	3.08E-03	-.1	-4.04E-02	-1.56E-02	4.68E-04
2992.65373	-3.	8	2	7	9	1	8	1.53E-03	3.	1.52E-03	.4	2.79E-02	1.11E-02	-2.19E-05
2993.73595	-1.	7	1	6	8	2	7	2.95E-03	2.	2.98E-03	-.9	-3.96E-02	-1.52E-02	2.51E-04
2994.44644	3.	7	0	7	8	1	8	8.70E-03	4.	8.53E-03	2.0	-6.84E-02	-2.40E-02	6.43E-05
2995.45513	3.	7	1	7	8	0	8	2.85E-03	2.	2.86E-03	-.4	3.96E-02	1.39E-02	-2.20E-05
2998.97188	23.	9	3	7	10	2	8	7.83E-05	2.	7.67E-05	2.0	5.97E-03	2.77E-03	1.09E-05
2999.86230	60.	11	4	8	12	3	9	3.22E-06	4.	3.47E-06	-7.6	1.11E-03	7.27E-04	2.08E-05
3003.47424	1.	6	1	5	7	2	6	1.83E-03	2.	1.80E-03	1.9	-3.11E-02	-1.15E-02	2.25E-04
3004.68680	46.	4	4	1	5	5	0	6.30E-03	4.	6.02E-03	4.4	-5.04E-02	-2.73E-02	6.53E-05
3004.70250	-44.	4	4	0	5	5	1	2.10E-03	4.	2.01E-03	4.3	-2.91E-02	-1.57E-02	3.77E-05
3004.98381	11.	12	2	11	12	3	10	1.15E-05	3.	1.21E-05	-5.0	2.55E-03	9.02E-04	2.38E-05
3005.44560	23.	5	5	1	6	6	0	7.25E-04	5.	6.12E-04	15.6	-1.44E-02	-1.03E-02	3.35E-05
3005.45440	-38.	5	5	0	6	6	1	2.18E-03	5.	1.78E-03	18.2	-2.48E-02	-1.74E-02	4.48E-05
3006.42575	-22.	12	1	11	12	2	10	4.52E-06	3.	4.17E-06	7.7	1.51E-03	5.23E-04	1.24E-05
3009.65271	5.	8	1	8	8	2	7	1.10E-03	3.	1.08E-03	2.1	2.50E-02	7.66E-03	1.19E-04
3010.23220	-26.	3	2	1	4	3	2	1.58E-02	3.	1.61E-02	-.8	-9.26E-02	-3.48E-02	5.59E-04
3011.27736	0.	7	2	6	8	1	7	1.05E-03	3.	1.04E-03	.6	2.33E-02	9.01E-03	0.00E+00
3011.90863	0.	8	0	8	8	1	7	3.73E-04	2.	3.73E-04	.0	1.48E-02	4.46E-03	5.68E-05
3012.23200	-15.	6	6	1	7	7	0	4.55E-04	4.	3.89E-04	14.5	-9.73E-03	-1.02E-02	2.05E-04
3012.34352	4.	6	6	0	7	7	1	1.78E-04	3.	1.40E-04	21.4	-5.81E-03	-6.01E-03	-1.22E-05
3012.37684	-10.	3	3	1	4	4	0	4.90E-03	2.	4.89E-03	.2	-4.88E-02	-2.12E-02	3.55E-05
3013.57316	-1.	6	0	6	7	1	7	4.98E-03	5.	5.02E-03	-.7	-5.28E-02	-1.81E-02	5.50E-05
3015.61527	-7.	6	1	6	7	0	7	1.56E-02	3.	1.52E-02	2.8	9.18E-02	3.14E-02	-3.11E-05
3021.31066	11.	11	2	10	11	3	9	1.47E-05	3.	1.46E-05	.4	2.83E-03	9.71E-04	2.57E-05
3022.36620	-6.	4	1	3	5	2	4	4.38E-03	3.	4.43E-03	-.1	-4.97E-02	-1.72E-02	3.55E-04
3022.66503	13.	8	3	6	9	2	7	5.33E-04	2.	5.25E-04	1.5	1.58E-02	7.01E-03	1.24E-04
3024.15449	21.	11	1	10	11	2	9	4.68E-05	3.	4.67E-05	.1	5.10E-03	1.70E-03	3.74E-05
3025.76102	3.	2	1	2	3	2	1	1.34E-02	4.	1.34E-02	-.1	-8.71E-02	-2.91E-02	4.12E-04
3028.90773	-13.	10	4	7	11	3	8	3.35E-05	2.	2.92E-05	13.0	3.35E-03	1.97E-03	8.27E-05
3029.91060	6.	7	1	7	7	2	6	8.22E-04	2.	8.20E-04	.2	2.20E-02	6.58E-03	1.02E-04
3030.72660	-17.	2	2	1	3	3	0	2.43E-02	3.	2.51E-02	-.3.2	-1.16E-01	-4.22E-02	0.00E+00
3031.73414	2.	5	0	5	6	1	6	2.33E-02	3.	2.35E-02	-.1.0	-1.15E-01	-3.82E-02	1.44E-04
3031.95669	-3.	6	2	5	7	1	6	5.52E-03	2.	5.58E-03	-.1.1	5.43E-02	2.02E-02	1.56E-04
3031.99122	-8.	2	2	0	3	3	1	8.51E-03	3.	8.49E-03	.2	-6.76E-02	-2.45E-02	0.00E+00
3034.26407	-19.	3	1	2	4	2	3	1.81E-02	3.	1.86E-02	-2.6	-1.02E-01	-3.44E-02	5.67E-04
3034.39503	0.	7	0	7	7	1	6	2.63E-03	2.	2.67E-03	-.1.5	3.99E-02	1.17E-02	1.24E-04
3035.78362	2.	5	1	5	6	0	6	7.85E-03	2.	7.95E-03	-.1.3	6.69E-02	2.22E-02	0.00E+00
3037.09961	2.	10	2	9	10	3	8	1.48E-04	2.	1.45E-04	2.2	8.97E-03	2.98E-03	8.01E-05
3042.42387	28.	10	1	9	10	2	8	5.27E-05	2.	5.40E-05	-2.5	5.55E-03	1.77E-03	3.45E-05
3048.67233	-3.	4	0	4	5	1	5	1.06E-02	3.	1.07E-02	-1.4	-7.85E-02	-2.52E-02	1.20E-04
3048.94745	-5.	6	1	6	6	2	5	4.98E-03	3.	5.05E-03	-.1.3	5.47E-02	1.61E-02	2.55E-04
3049.04450	-3.	2	1	1	3	2	2	8.04E-03	2.	8.14E-03	-.1.2	-6.83E-02	-2.21E-02	2.07E-04
3050.70281	6.	7	3	5	8	2	6	3.29E-04	2.	3.36E-04	-2.1	1.27E-02	5.41E-03	1.91E-04
3052.00952	2.	9	2	8	9	3	7	1.42E-04	3.	1.43E-04	-.7	8.97E-03	2.91E-03	8.02E-05
3055.61013	-6.	5	2	4	6	1	5	2.73E-03	2.	2.75E-03	-.7	3.85E-02	1.37E-02	2.10E-04
3056.35632	-2.	4	1	4	5	0	5	3.30E-02	2.	3.27E-02	1.0	1.37E-01	4.39E-02	6.01E-05
3057.14658	0.	6	0	6	6	1	5	1.95E-03	3.	1.95E-03	.0	3.44E-02	9.74E-03	7.85E-05
3059.92945	3.	1	1	1	2	2	0	8.27E-03	3.	8.33E-03	-.7	-6.94E-02	-2.18E-02	0.00E+00
3061.22892	10.	9	1	8	9	2	7	5.10E-04	2.	5.20E-04	-2.1	1.74E-02	5.29E-03	8.67E-05
3062.28310	78.	13	2	11	13	3	10	2.06E-06	10.	2.11E-06	-2.6	1.06E-03	3.78E-04	1.29E-05
3062.34785	9.	9	4	6	10	3	7	2.45E-05	3.	2.46E-05	-.5	3.12E-03	1.72E-03	1.18E-04
3064.40416	1.	3	0	3	4	1	4	3.80E-02	2.	3.85E-02	-.1.3	-1.50E-01	-4.65E-02	2.65E-04
3065.61738	-2.	8	2	7	8	3	6	1.14E-03	2.	1.13E-03	.9	2.53E-02	8.06E-03	2.32E-04
3066.27142	-4.	5	1	5	5	2	4	3.07E-03	2.	3.03E-03	1.2	4.25E-02	1.23E-02	2.04E-04
3067.01176	-3.	1	1	0	2	2	1	3.02E-02	3.	3.01E-02	.4	-1.32E-01	-4.11E-02	0.00E+00
3068.93050	-3.	12	3	10	12	4	9	7.10E-06	7.	7.06E-06	.6	1.94E-03	6.54E-04	5.85E-05

Table 8 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	ts	computed strength	(o-c) t	Z(020)	Z(100)	Z(001)
3076.22660	-30.	12 2 10	12 3 9	2.40E-06	6.	2.57E-06	-6.9	1.13E-03	5.04E-04	-3.35E-05
3077.47344	-1.	7 2 6	7 3 5	8.65E-04	2.	8.69E-04	-5.	2.23E-02	7.00E-03	2.14E-04
3077.93830	-1.	3 1 3	4 0 4	1.23E-02	3.	1.25E-02	-1.9	8.55E-02	2.64E-02	8.73E-05
3079.06010	0.	11 3 9	11 4 8	9.70E-06	3.	9.98E-06	-2.8	2.27E-03	8.60E-04	2.67E-05
3079.52895	0.	5 0 5	5 1 4	1.21E-02	3.	1.20E-02	.6	8.60E-02	2.35E-02	1.29E-04
3079.68270	1.	2 0 2	3 1 3	1.33E-02	2.	1.35E-02	-1.3	-8.96E-02	-2.67E-02	1.49E-04
3079.92632	7.	8 1 7	8 2 6	4.98E-04	2.	5.17E-04	-3.8	1.76E-02	5.09E-03	6.74E-05
3081.34196	0.	4 1 4	4 2 3	1.37E-02	3.	1.41E-02	-3.2	9.21E-02	2.64E-02	4.63E-04
3082.55629	7.	6 3 4	7 2 5	1.61E-03	3.	1.62E-03	-.4	2.82E-02	1.14E-02	6.31E-04
3082.60700	5.	4 2 3	5 1 4	9.55E-03	2.	9.76E-03	-2.2	7.33E-02	2.49E-02	5.97E-04
3087.19210	3.	6 2 5	6 3 4	5.05E-03	2.	5.17E-03	-2.4	5.44E-02	1.69E-02	5.58E-04
3088.13800	33.	11 5 7	12 4 8	2.10E-06	10.	1.77E-06	15.7	5.57E-04	6.67E-04	1.06E-04
3088.39982	1.	10 3 8	10 4 7	1.01E-04	3.	1.01E-04	-.2	7.29E-03	2.66E-03	1.05E-04
3090.07830	-18.	4 0 4	3 3 1	3.40E-06	4.	3.24E-06	4.7	-1.14E-03	-5.31E-04	-1.24E-04
3092.43016	13.	11 2 9	11 3 8	4.25E-05	2.	4.32E-05	-1.7	4.95E-03	1.60E-03	2.66E-05
3093.68955	-9.	3 1 3	3 2 2	6.01E-03	2.	5.95E-03	1.0	5.98E-02	1.70E-02	3.19E-04
3094.54785	-2.	5 2 4	5 3 3	2.83E-03	2.	2.85E-03	-.7	4.04E-02	1.26E-02	4.47E-04
3095.94498	4.	1 0 1	2 1 2	3.70E-02	4.	3.74E-02	-1.2	-1.51E-01	-4.30E-02	1.57E-04
3096.05540	2.	9 3 7	9 4 6	1.02E-04	3.	9.97E-05	2.3	7.27E-03	2.60E-03	1.15E-04
3096.08500	74.	6 0 6	5 3 3	3.94E-06	10.	3.55E-06	9.9	-9.62E-04	-6.79E-04	-2.44E-04
3096.46960	1.	5 0 5	4 3 2	1.78E-05	2.	1.54E-05	13.8	-2.32E-03	-1.24E-03	-3.62E-04
3096.92638	3.	7 1 6	7 2 5	4.17E-03	2.	4.21E-03	-.9	5.06E-02	1.41E-02	1.55E-04
3098.81641	25.	8 4 5	9 3 6	1.69E-04	3.	1.64E-04	2.9	8.13E-03	4.25E-03	4.28E-04
3099.54760	1.	4 2 3	4 3 2	1.08E-02	2.	1.11E-02	-3.2	7.97E-02	2.49E-02	9.56E-04
3099.80083	5.	4 0 4	4 1 3	7.48E-03	2.	7.56E-03	-1.1	6.86E-02	1.82E-02	6.89E-05
3101.15571	1.	2 1 2	3 0 3	3.34E-02	3.	3.36E-02	-.5	1.41E-01	4.16E-02	2.24E-04
3101.87788	1.	8 3 6	8 4 5	7.75E-04	2.	7.63E-04	1.6	2.01E-02	7.15E-03	3.48E-04
3103.01575	4.	2 1 2	2 2 1	1.59E-02	3.	1.57E-02	1.2	9.73E-02	2.75E-02	5.50E-04
3105.87046	-11.	7 3 5	7 4 4	5.60E-04	2.	5.50E-04	1.8	1.71E-02	6.07E-03	3.21E-04
3106.06741	-2.	10 2 8	10 3 7	5.52E-05	2.	5.65E-05	-2.3	5.74E-03	1.74E-03	3.13E-05
3107.33075	-2.	3 2 1	3 3 0	1.01E-02	2.	1.04E-02	-2.8	7.70E-02	2.39E-02	9.57E-04
3108.24122	-4.	6 3 4	6 4 3	2.96E-03	2.	2.95E-03	.3	3.94E-02	1.41E-02	8.09E-04
3109.37835	-9.	5 3 3	5 4 2	1.43E-03	2.	1.40E-03	2.4	2.70E-02	9.78E-03	6.00E-04
3109.75826	-7.	4 3 2	4 4 1	4.02E-03	3.	4.01E-03	.4	4.55E-02	1.67E-02	1.09E-03
3110.30902	7.	6 1 5	6 2 4	3.28E-03	2.	3.33E-03	-1.5	4.53E-02	1.23E-02	1.26E-04
3110.59277	-9.	4 3 1	4 4 0	1.36E-03	2.	1.35E-03	.9	2.64E-02	9.66E-03	6.27E-04
3112.09667	-1.	4 2 2	4 3 1	4.29E-03	2.	4.32E-03	-.6	5.00E-02	1.52E-02	5.38E-04
3112.18363	2.	3 2 2	4 1 3	2.91E-03	2.	2.89E-03	.7	4.04E-02	1.30E-02	4.12E-04
3112.38980	-2.	5 3 2	5 4 1	4.35E-03	3.	4.31E-03	1.0	4.75E-02	1.71E-02	1.03E-03
3112.84320	15.	8 1 8	7 2 5	5.65E-06	3.	4.49E-06	20.5	9.01E-04	8.25E-04	3.94E-04
3114.17900	-26.	12 4 9	12 5 8	4.45E-06	6.	4.24E-06	4.7	1.35E-03	7.42E-04	-3.15E-05
3114.49303	8.	0 0 0	1 1 1	9.92E-03	2.	9.87E-03	.5	-7.82E-02	-2.12E-02	0.00E+00
3115.87673	0.	3 0 3	3 1 2	3.72E-02	2.	3.69E-02	.7	1.52E-01	3.97E-02	1.30E-04
3116.01353	6.	6 3 3	6 4 2	1.07E-03	2.	1.06E-03	1.0	2.38E-02	8.31E-03	4.57E-04
3116.62315	17.	9 2 7	9 3 6	5.83E-04	2.	5.85E-04	-.3	1.67E-02	5.43E-03	9.99E-05
3116.71942	5.	5 3 3	6 2 4	7.16E-04	2.	7.12E-04	.6	1.89E-02	7.25E-03	5.43E-04
3118.11005	-6.	5 2 3	5 3 2	1.09E-02	3.	1.13E-02	-3.5	8.14E-02	2.41E-02	7.31E-04
3118.94392	-2.	5 1 4	5 2 3	1.91E-02	2.	1.96E-02	-2.4	1.10E-01	2.96E-02	3.19E-04
3119.18203	-1.	2 1 1	2 2 0	7.77E-03	2.	7.73E-03	.6	6.87E-02	1.89E-02	3.29E-04
3119.94481	3.	11 4 8	11 5 7	5.26E-06	4.	5.55E-06	-5.6	1.61E-03	7.18E-04	2.89E-05
3121.59985	9.	7 3 4	7 4 3	1.89E-03	2.	1.91E-03	-1.0	3.22E-02	1.09E-02	5.29E-04
3122.47014	-4.	3 1 2	3 2 1	3.28E-02	2.	3.30E-02	-.6	1.42E-01	3.86E-02	5.66E-04
3122.79539	-7.	4 1 3	4 2 2	9.77E-03	2.	9.94E-03	-1.7	7.84E-02	2.11E-02	2.61E-04
3123.06805	21.	8 2 6	8 3 5	5.70E-04	2.	5.68E-04	.3	1.85E-02	5.27E-03	1.04E-04
3123.13014	-7.	6 2 4	6 3 3	2.55E-03	2.	2.55E-03	-.2	3.90E-02	1.13E-02	2.90E-04
3123.41248	3.	10 4 7	10 5 6	5.50E-05	3.	5.44E-05	1.1	5.06E-03	2.19E-03	1.21E-04
3125.13178	-6.	7 2 5	7 3 4	4.00E-03	2.	4.07E-03	-1.7	4.94E-02	1.41E-02	3.12E-04
3125.51643	-3.	9 4 6	9 5 5	5.00E-05	3.	5.09E-05	-1.8	4.89E-03	2.11E-03	1.35E-04
3126.00249	-4.	1 1 1	2 0 2	6.55E-03	2.	6.44E-03	1.7	6.27E-02	1.74E-02	1.13E-04
3126.56860	9.	8 4 5	8 5 4	3.85E-04	2.	3.65E-04	5.2	1.30E-02	5.67E-03	4.01E-04
3126.78520	-4.	2 0 2	2 1 1	1.58E-02	3.	1.58E-02	.1	9.98E-02	2.58E-02	9.18E-05
3127.42006	-4.	6 4 2	6 5 1	4.02E-04	2.	3.84E-04	4.4	1.32E-02	5.90E-03	4.81E-04
3128.06590	8.	10 5 6	11 4 7	1.37E-05	4.	1.32E-05	3.6	1.73E-03	1.63E-03	2.74E-04
3128.10084	2.	8 3 5	8 4 4	3.17E-04	2.	3.21E-04	-1.3	1.34E-02	4.36E-03	1.82E-04
3128.55876	-5.	7 4 3	7 5 2	7.61E-04	2.	7.37E-04	3.1	1.85E-02	8.07E-03	6.12E-04
3133.06957	-1.	1 0 1	1 1 0	4.20E-02	2.	4.19E-02	.1	1.63E-01	4.18E-02	1.69E-04
3133.56880	-7.	9 3 6	9 4 5	4.03E-04	2.	4.02E-04	.3	1.51E-02	4.77E-03	1.71E-04
3134.49750	13.	9 4 5	9 5 4	1.77E-04	5.	1.64E-04	7.1	8.93E-03	3.66E-03	2.34E-04
3135.37910	11.	11 3 8	11 4 7	3.90E-05	2.	3.87E-05	.6	4.71E-03	1.48E-03	3.67E-05
3136.27988	0.	10 3 7	10 4 6	4.36E-05	2.	4.59E-05	-5.2	5.13E-03	1.60E-03	4.85E-05
3136.41190	16.	7 4 4	8 3 5	1.05E-04	3.	1.06E-04	-.9	6.57E-03	3.29E-03	4.35E-04

Table 8 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	%s	computed strength	(o-c)%	Z(020)	Z(100)	Z(001)
3136.74535	9.	7 1 7	6 2 4	1.06E-05	3.	8.76E-06	17.4	1.81E-03	8.32E-04	3.14E-04
3139.66780	-14.	10 4 6	10 5 5	2.05E-05	3.	2.07E-05	-1.1	3.21E-03	1.27E-03	7.54E-05
3142.77956	2.	2 2 1	3 1 2	4.95E-03	3.	4.87E-03	1.6	5.32E-02	1.60E-02	5.84E-04
3145.41371	13.	11 4 7	11 5 6	2.05E-05	3.	2.01E-05	1.8	3.21E-03	1.22E-03	5.73E-05
3151.35542	7.	4 3 2	5 2 3	2.18E-03	2.	2.22E-03	-1.7	3.38E-02	1.22E-02	1.11E-03
3152.10094	-4.	10 5 6	10 6 5	2.58E-05	3.	2.22E-05	14.1	2.88E-03	1.72E-03	1.01E-04
3152.28080	0.	6 5 2	6 6 1	3.17E-04	3.	2.75E-04	13.3	1.01E-02	6.18E-03	2.47E-04
3152.30250	-12.	6 5 1	6 6 0	1.06E-04	3.	9.54E-05	10.0	5.87E-03	3.55E-03	3.54E-04
3152.35617	4.	7 5 3	7 6 2	8.60E-05	3.	7.92E-05	7.9	5.38E-03	3.22E-03	2.97E-04
3152.39500	-33.	9 5 5	9 6 4	2.09E-05	2.	1.98E-05	5.4	2.72E-03	1.61E-03	1.20E-04
3152.42329	2.	8 5 4	8 6 3	1.48E-04	3.	1.33E-04	10.1	7.01E-03	4.17E-03	3.52E-04
3152.44235	-7.	7 5 2	7 6 1	2.54E-04	2.	2.38E-04	6.4	9.32E-03	5.57E-03	5.25E-04
3152.62700	315.	13 4 9	13 5 8	1.16E-06	5.	1.28E-06	-10.3	8.20E-04	3.05E-04	6.14E-06
3152.72461	-17.	8 5 3	8 6 2	4.95E-05	3.	4.44E-05	10.3	4.06E-03	2.39E-03	2.11E-04
3153.27893	-10.	9 5 4	9 6 3	6.83E-05	2.	5.93E-05	13.2	4.73E-03	2.75E-03	2.20E-04
3154.34840	-19.	10 5 5	10 6 4	9.03E-06	3.	7.66E-06	15.2	1.67E-03	9.75E-04	1.22E-04
3155.34825	4.	6 1 6	5 2 3	1.33E-04	2.	1.23E-04	7.7	7.84E-03	2.54E-03	6.99E-04
3156.13170	-1.	11 5 6	11 6 5	7.90E-06	5.	7.31E-06	7.5	1.69E-03	9.47E-04	6.53E-05
3163.82721	6.	3 1 3	2 2 0	5.22E-04	3.	5.04E-04	3.4	1.77E-02	4.40E-03	3.36E-04
3164.18558	14.	6 3 3	7 2 6	2.84E-04	2.	2.83E-04	.3	1.12E-02	4.81E-03	7.99E-04
3165.66644	-5.	9 4 5	10 3 8	5.64E-05	3.	5.44E-05	3.5	4.29E-03	2.53E-03	5.54E-04
3166.70071	5.	5 1 5	4 2 2	1.56E-04	2.	1.51E-04	3.2	9.30E-03	2.52E-03	4.67E-04
3167.18820	43.	9 5 5	10 4 6	1.18E-05	6.	1.13E-05	4.5	1.67E-03	1.41E-03	2.76E-04
3167.23672	7.	7 3 4	8 2 7	3.54E-04	3.	3.66E-04	-3.3	1.22E-02	5.76E-03	1.16E-03
3167.91110	14.	3 2 1	4 1 4	2.63E-03	2.	2.64E-03	-.4	3.82E-02	1.22E-02	1.00E-03
3169.31353	-20.	4 2 2	5 1 5	5.53E-04	4.	5.41E-04	2.1	1.68E-02	5.81E-03	6.72E-04
3169.54796	8.	4 1 4	3 2 1	1.21E-03	2.	1.16E-03	4.3	2.66E-02	6.67E-03	7.94E-04
3169.81962	3.	5 3 2	6 2 5	1.50E-03	2.	1.53E-03	-2.0	2.70E-02	1.06E-02	1.53E-03
3170.08176	-4.	8 4 4	9 3 7	1.54E-04	2.	1.55E-04	-.8	3.24E-03	7.79E-03	1.43E-03
3173.15850	9.	6 4 3	7 3 4	5.08E-04	2.	5.20E-04	-2.4	1.47E-02	6.96E-03	1.14E-03
3174.93228	12.	2 2 0	3 1 3	8.32E-04	2.	8.21E-04	1.3	2.18E-02	6.47E-03	3.92E-04
3175.22680	18.	11 5 6	12 4 9	4.50E-06	6.	4.20E-06	6.8	9.31E-04	8.47E-04	2.70E-04
3178.11896	-12.	1 1 0	1 0 1	4.42E-02	3.	4.37E-02	1.2	1.69E-01	4.05E-02	0.00E+00
3179.49101	6.	8 3 5	9 2 8	4.08E-05	2.	4.40E-05	-7.8	3.96E-03	2.14E-03	5.31E-04
3179.66986	5.	5 2 3	6 1 6	7.47E-04	3.	7.68E-04	-2.8	1.92E-02	7.31E-03	1.19E-03
3181.90270	72.	11 4 7	12 3 10	5.60E-06	6.	5.08E-06	9.4	1.05E-03	9.12E-04	2.88E-04
3182.27837	5.	7 4 3	8 3 6	3.35E-04	2.	3.39E-04	-1.1	1.11E-02	6.06E-03	1.21E-03
3182.51832	3.	4 3 1	5 2 4	6.42E-04	2.	6.49E-04	-1.1	1.80E-02	6.60E-03	8.51E-04
3183.05100	-50.	10 6 4	10 7 3	2.86E-06	10.	2.30E-06	19.6	7.43E-04	7.95E-04	-2.11E-05
3183.26790	10.	11 6 5	11 7 4	2.85E-06	5.	2.40E-06	15.9	7.62E-04	7.82E-04	4.01E-06
3184.16360	-12.	7 6 1	7 7 0	6.42E-05	2.	4.89E-05	23.8	3.52E-03	3.14E-03	3.35E-04
3184.39760	17.	8 6 2	8 7 1	1.44E-05	4.	1.10E-05	23.9	1.71E-03	1.39E-03	2.16E-04
3184.73163	6.	3 3 1	4 2 2	4.86E-04	2.	4.91E-04	-.9	1.61E-02	5.47E-03	5.56E-04
3184.82405	0.	2 0 2	1 1 1	6.25E-03	3.	6.16E-03	1.5	6.41E-02	1.42E-02	1.36E-04
3185.25511	-3.	2 1 1	2 0 2	1.57E-02	3.	1.59E-02	-1.2	1.02E-01	2.41E-02	-5.00E-05
3185.74330	-21.	9 6 3	9 7 2	1.08E-05	4.	8.89E-06	17.7	1.64E-03	8.52E-04	4.92E-04
3186.78116	36.	10 5 5	11 4 8	7.45E-06	4.	8.44E-06	-13.3	1.00E-03	8.85E-04	1.02E-03
3196.64586	-4.	4 2 3	3 3 0	9.42E-04	2.	9.39E-04	.3	2.36E-02	6.20E-03	8.04E-04
3197.86481	-8.	3 1 2	3 0 3	3.55E-02	2.	3.56E-02	-.3	1.54E-01	3.52E-02	-1.81E-04
3198.19995	2.	6 2 4	7 1 7	1.00E-04	3.	1.09E-04	-8.9	6.82E-03	2.95E-03	6.62E-04
3199.35853	2.	6 4 2	7 3 5	1.84E-04	2.	1.88E-04	-2.3	8.61E-03	4.24E-03	8.71E-04
3199.72497	7.	3 1 2	2 2 1	4.42E-03	2.	4.37E-03	1.0	5.36E-02	1.20E-02	5.67E-04
3200.17020	4.	9 3 6	10 2 9	4.18E-05	2.	4.41E-05	-5.4	3.59E-03	2.33E-03	7.11E-04
3200.27642	1.	3 3 0	4 2 3	1.42E-03	3.	1.44E-03	-1.2	2.74E-02	9.35E-03	1.11E-03
3203.32600	-7.	9 5 4	10 4 7	3.30E-05	3.	3.17E-05	3.8	3.01E-03	2.16E-03	4.64E-04
3203.79922	-16.	8 5 4	9 4 5	7.70E-05	5.	7.71E-05	-.1	4.48E-03	3.51E-03	7.90E-04
3209.74614	-1.	3 0 3	2 1 2	3.36E-02	3.	3.32E-02	1.0	1.51E-01	3.07E-02	2.76E-04
3210.71974	-11.	4 2 2	3 3 1	3.86E-04	2.	3.87E-04	-.1	1.54E-02	3.82E-03	4.44E-04
3214.12290	-10.	2 1 2	1 0 1	4.15E-02	3.	4.10E-02	1.2	-1.68E-01	-3.49E-02	3.42E-04
3214.67360	15.	5 2 4	4 3 1	3.65E-04	4.	3.58E-04	1.9	1.46E-02	3.71E-03	6.15E-04
3216.52224	0.	4 1 3	4 0 4	7.03E-03	2.	7.03E-03	.0	6.88E-02	1.51E-02	-1.30E-04
3218.08400	91.	9 2 8	8 3 5	4.20E-06	3.	3.53E-06	15.9	1.10E-03	5.24E-04	2.50E-04
3219.38352	-2.	3 2 1	3 1 2	2.98E-02	3.	3.08E-02	-3.4	1.42E-01	3.30E-02	3.79E-04
3220.00824	6.	5 4 1	6 3 4	6.83E-04	3.	6.97E-04	-2.0	1.71E-02	7.77E-03	1.56E-03
3220.44214	-1.	4 2 2	4 1 3	8.72E-03	3.	8.88E-03	-1.8	7.66E-02	1.75E-02	1.50E-04
3222.03471	0.	2 2 0	2 1 1	7.76E-03	3.	7.70E-03	.7	7.09E-02	1.67E-02	2.41E-04
3223.32582	5.	7 2 5	8 1 8	1.26E-04	2.	1.38E-04	-9.8	7.06E-03	3.63E-03	1.06E-03
3223.48150	-29.	8 5 3	9 4 6	2.46E-05	5.	2.40E-05	2.6	2.69E-03	1.75E-03	4.56E-04
3227.35880	9.	6 2 5	5 3 2	6.20E-04	4.	6.41E-04	-3.4	1.93E-02	4.93E-03	1.07E-03
3227.46465	0.	5 2 3	5 1 4	1.59E-02	3.	1.67E-02	-5.2	1.06E-01	2.33E-02	1.42E-04
3227.59600	-92.	10 3 7	11 2 10	4.00E-06	10.	4.97E-06	-24.2	1.03E-03	8.78E-04	3.16E-04

Table 8 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	%s	computed strength	(o-c)%	Z(020)	Z(100)	Z(001)
3229.37672	-2.	8 2 7	7 3 4	6.15E-05	3.	5.87E-05	4.6	5.26E-03	1.74E-03	6.60E-04
3229.90022	-3.	3 1 3	2 0 2	1.51E-02	2.	1.53E-02	-1.4	-1.04E-01	-2.00E-02	2.31E-04
3231.35855	-15.	5 3 3	4 4 0	1.03E-04	2.	1.03E-04	.5	7.45E-03	2.24E-03	4.37E-04
3232.27355	-2.	4 1 3	3 2 2	2.66E-03	3.	2.63E-03	1.1	4.23E-02	8.56E-03	4.30E-04
3232.61891	13.	7 2 6	6 3 3	8.16E-05	2.	7.87E-05	3.6	6.55E-03	1.80E-03	5.21E-04
3233.01935	1.	4 0 4	3 1 3	1.32E-02	2.	1.31E-02	.8	9.65E-02	1.78E-02	1.26E-04
3234.62320	-9.	5 3 2	4 4 1	3.25E-04	2.	3.20E-04	1.7	1.32E-02	3.90E-03	7.50E-04
3236.64897	1.	2 2 1	2 1 2	1.75E-02	3.	1.77E-02	-1.1	1.08E-01	2.49E-02	3.83E-04
3236.77050	17.	7 5 3	8 4 4	4.72E-05	3.	4.78E-05	-1.4	3.62E-03	2.64E-03	6.61E-04
3237.95060	3.	4 4 1	5 3 2	4.95E-04	3.	5.03E-04	-1.6	1.49E-02	6.27E-03	1.22E-03
3240.10670	-1.	5 1 4	5 0 5	1.13E-02	3.	1.13E-02	.0	8.81E-02	1.84E-02	-2.06E-04
3241.77341	7.	6 2 4	6 1 5	2.74E-03	3.	2.69E-03	1.7	4.29E-02	8.99E-03	0.00E+00
3242.80789	3.	4 4 0	5 3 3	1.69E-04	2.	1.73E-04	-2.4	8.72E-03	3.69E-03	7.42E-04
3244.40529	1.	5 2 3	4 3 2	1.77E-03	3.	1.77E-03	-.2	3.36E-02	7.52E-03	9.82E-04
3244.94259	0.	4 1 4	3 0 3	4.49E-02	2.	4.50E-02	-.1	-1.80E-01	-3.21E-02	3.19E-04
3245.40216	-1.	3 2 2	3 1 3	6.70E-03	4.	6.65E-03	.7	6.64E-02	1.50E-02	1.89E-04
3245.92850	11.	7 5 2	8 4 5	1.26E-04	3.	1.27E-04	-.7	6.43E-03	3.74E-03	1.10E-03
3251.63510	-18.	10 6 4	11 5 7	1.32E-05	4.	1.36E-05	-3.0	4.75E-04	2.66E-03	5.53E-04
3253.01550	-2.	8 2 6	9 1 9	1.76E-05	2.	2.04E-05	-15.9	2.40E-03	1.55E-03	5.62E-04
3254.14814	5.	5 0 5	4 1 4	3.59E-02	2.	3.61E-02	-.4	1.63E-01	2.70E-02	1.35E-04
3254.62489	1.	6 3 4	5 4 1	3.87E-04	2.	3.76E-04	2.7	1.44E-02	4.10E-03	9.50E-04
3257.22613	4.	4 2 3	4 1 4	1.54E-02	2.	1.58E-02	-2.3	1.03E-01	2.23E-02	2.10E-04
3260.42739	-5.	5 1 5	4 0 4	1.29E-02	3.	1.27E-02	1.2	-9.72E-02	-1.58E-02	1.08E-04
3263.27440	1.	7 2 5	7 1 6	3.37E-03	2.	3.27E-03	2.9	4.79E-02	9.34E-03	0.00E+00
3263.67922	-1.	6 3 3	5 4 2	1.39E-04	2.	1.39E-04	-.3	8.87E-03	2.41E-03	5.34E-04
3265.09233	0.	5 1 4	4 2 3	8.68E-03	2.	9.12E-03	-5.0	8.03E-02	1.45E-02	7.15E-04
3266.10190	26.	6 5 2	7 4 3	2.10E-04	8.	1.77E-04	15.6	7.56E-03	5.09E-03	6.58E-04
3266.38590	5.	6 1 5	6 0 6	1.95E-03	3.	1.91E-03	1.9	3.66E-02	7.23E-03	-8.96E-05
3269.61705	-1.	6 5 1	7 4 4	5.29E-05	2.	5.32E-05	-.6	4.43E-03	2.13E-03	7.38E-04
3270.42704	0.	7 3 4	7 2 5	2.98E-03	2.	2.96E-03	.8	4.48E-02	9.21E-03	3.27E-04
3271.02026	10.	6 3 3	6 2 4	2.03E-03	3.	1.97E-03	2.8	3.63E-02	7.80E-03	3.02E-04
3271.89035	-15.	5 2 4	5 1 5	3.42E-03	3.	3.39E-03	.9	4.82E-02	9.99E-03	5.97E-05
3272.51820	8.	4 3 2	5 0 5	2.04E-04	2.	2.14E-04	-5.0	-9.67E-03	-3.97E-03	-9.94E-04
3272.79640	13.	5 3 3	6 0 6	6.84E-05	3.	7.49E-05	-9.5	-5.40E-03	-2.52E-03	-7.31E-04
3273.42679	-10.	6 0 6	5 1 5	9.33E-03	3.	9.20E-03	1.4	8.35E-02	1.23E-02	4.47E-05
3273.43890	18.	6 4 3	5 5 0	8.40E-05	10.	7.43E-05	11.6	5.87E-03	2.19E-03	5.55E-04
3273.77370	10.	2 2 1	1 1 0	3.60E-02	4.	3.54E-02	1.8	-1.57E-01	-3.11E-02	5.50E-04
3273.98010	37.	6 4 2	5 5 1	2.60E-05	5.	2.49E-05	4.2	3.41E-03	1.26E-03	3.19E-04
3275.83420	-8.	7 3 5	6 4 2	8.75E-05	3.	8.76E-05	-.1	6.92E-03	1.91E-03	5.29E-04
3276.22039	8.	5 3 2	5 2 3	9.60E-03	3.	9.47E-03	1.3	7.90E-02	1.75E-02	7.79E-04
3276.51097	-1.	6 1 6	5 0 5	2.82E-02	3.	2.83E-02	-.5	-1.47E-01	-2.14E-02	8.13E-05
3276.96471	4.	8 3 5	8 2 6	4.16E-04	2.	3.93E-04	5.4	1.66E-02	3.16E-03	1.18E-04
3277.61270	8.	9 6 3	10 5 6	1.86E-04	3.	1.91E-04	-2.7	1.57E-03	-1.47E-02	-6.96E-04
3278.45850	16.	3 3 1	4 0 4	3.28E-05	2.	3.54E-05	-.8	-4.11E-03	-1.51E-03	-3.27E-04
3278.72262	12.	6 3 4	7 0 7	1.51E-04	2.	1.70E-04	-12.6	-7.57E-03	-4.10E-03	-1.37E-03
3280.07350	-2.	2 2 0	1 1 1	1.06E-02	3.	1.04E-02	1.5	-8.57E-02	-1.68E-02	3.56E-04
3280.71100	-2.	6 2 4	5 3 3	5.95E-04	2.	5.85E-04	1.6	1.98E-02	3.87E-03	5.50E-04
3282.94743	-6.	4 3 1	4 2 2	4.11E-03	2.	4.06E-03	1.2	5.14E-02	1.17E-02	5.95E-04
3284.99220	-1.	9 2 7	10 1 10	2.80E-05	8.	2.94E-05	-5.1	2.41E-03	2.14E-03	8.80E-04
3288.46261	28.	3 3 0	3 2 1	1.12E-02	3.	1.10E-02	1.8	8.41E-02	1.97E-02	1.10E-03
3288.91839	-2.	6 2 5	6 1 6	5.78E-03	2.	5.68E-03	1.8	6.29E-02	1.24E-02	0.00E+00
3289.55030	-50.	7 3 5	8 0 8	3.30E-05	8.	3.58E-05	-8.5	-3.15E-03	-2.06E-03	-7.77E-04
3291.35674	2.	7 0 7	6 1 6	1.79E-02	3.	1.83E-02	-2.1	1.20E-01	1.55E-02	4.86E-05
3291.88285	15.	9 3 6	9 2 7	3.89E-04	4.	3.81E-04	2.1	1.66E-02	2.82E-03	1.42E-04
3292.50473	1.	3 2 2	2 1 1	1.00E-02	2.	9.77E-03	2.3	-8.43E-02	-1.51E-02	5.52E-04
3292.72372	20.	5 5 1	6 4 2	5.08E-05	2.	5.28E-05	-4.0	4.06E-03	2.51E-03	6.94E-04
3293.09266	3.	7 1 6	7 0 7	2.80E-03	2.	2.77E-03	1.0	4.45E-02	8.25E-03	-1.01E-04
3293.34940	10.	8 3 6	7 4 3	1.24E-04	2.	1.25E-04	-.7	8.18E-03	2.24E-03	7.52E-04
3293.78772	-22.	5 5 0	6 4 3	8.11E-05	2.	7.85E-05	3.3	7.11E-03	6.93E-04	1.06E-03
3294.20970	2.	3 3 1	3 2 2	3.69E-03	2.	3.70E-03	-.2	4.88E-02	1.14E-02	6.66E-04
3296.11205	-3.	7 3 4	6 4 3	3.24E-04	3.	3.40E-04	-5.0	1.41E-02	3.44E-03	8.65E-04
3296.87362	-9.	6 1 5	5 2 4	2.74E-03	3.	2.71E-03	1.0	4.47E-02	7.05E-03	3.19E-04
3297.50380	6.	4 3 2	4 2 3	1.18E-02	2.	1.21E-02	-2.6	8.89E-02	2.00E-02	1.14E-03
3297.93690	14.	7 4 4	6 5 1	2.75E-05	4.	2.85E-05	-3.6	3.66E-03	1.30E-03	3.78E-04
3299.79556	4.	7 4 3	6 5 2	8.70E-05	4.	8.73E-05	-.3	6.44E-03	2.25E-03	6.50E-04
3300.10742	7.	8 6 2	9 5 5	1.12E-05	4.	1.30E-05	-15.9	1.42E-03	-5.41E-03	3.86E-04
3302.65586	17.	8 4 5	9 1 8	5.67E-05	2.	6.05E-05	-6.7	-3.44E-03	-3.10E-03	-1.24E-03
3303.28418	5.	5 3 3	5 2 4	3.06E-03	3.	2.99E-03	2.4	4.45E-02	9.62E-03	5.40E-04
3303.67912	4.	7 4 4	8 1 7	2.77E-05	5.	3.09E-05	-11.5	-2.73E-03	-2.04E-03	-7.89E-04
3304.41822	16.	8 3 6	9 0 9	5.26E-05	2.	6.14E-05	-16.8	-3.61E-03	-2.99E-03	-1.24E-03
3305.16500	31.	9 3 7	8 4 4	1.43E-05	2.	1.38E-05	3.7	2.63E-03	7.67E-04	3.13E-04

Table 8 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(020)	Z(100)	Z(001)
3307.47930	22.	9 4 6	10 1 9	9.50E-06	8.	1.13E-05	-18.5	-1.27E-03	-1.48E-03	-6.06E-04
3307.68855	5.	7 2 6	7 1 7	9.52E-04	2.	9.41E-04	1.2	2.59E-02	4.81E-03	0.00E+00
3308.31966	-11.	8 0 8	7 1 7	3.50E-03	3.	3.57E-03	-2.1	5.38E-02	6.01E-03	2.07E-05
3308.69870	3.	4 2 3	3 1 2	2.28E-02	3.	2.29E-02	-7.	-1.31E-01	-2.14E-02	1.08E-03
3309.00939	6.	8 1 8	7 0 7	1.10E-02	3.	1.08E-02	2.2	-9.33E-02	-1.04E-02	0.00E+00
3311.30120	24.	6 4 3	7 1 6	9.57E-05	2.	1.06E-04	-11.1	-5.49E-03	-3.55E-03	-1.28E-03
3312.05470	5.	6 3 4	6 2 5	5.30E-03	3.	5.28E-03	.4	5.97E-02	1.22E-02	7.04E-04
3313.25298	2.	3 2 1	2 1 2	2.00E-02	2.	1.98E-02	1.2	-1.21E-01	-2.09E-02	1.19E-03
3314.76457	26.	10 3 7	10 2 8	3.48E-05	3.	3.50E-05	-.6	5.14E-03	7.12E-04	6.59E-05
3317.09920	-9.	10 2 8	11 1 11	4.60E-06	10.	5.43E-06	-18.0	7.84E-04	1.09E-03	4.55E-04
3318.50978	4.	7 2 5	6 3 4	1.37E-03	2.	1.37E-03	.2	3.10E-02	5.20E-03	7.77E-04
3318.77414	-16.	8 1 7	8 0 8	4.17E-04	2.	4.14E-04	.7	1.74E-02	3.01E-03	-3.48E-05
3320.46258	7.	9 2 7	9 1 8	4.23E-04	2.	4.16E-04	1.7	1.76E-02	2.69E-03	1.22E-04
3321.89970	-12.	8 4 5	7 5 2	5.85E-05	3.	5.84E-05	.2	5.27E-03	1.77E-03	5.93E-04
3322.40820	13.	9 3 7	10 0 10	9.57E-06	3.	1.15E-05	-20.5	-1.29E-03	-1.48E-03	-6.31E-04
3323.01890	-3.	5 2 4	4 1 3	5.73E-03	6.	5.63E-03	1.8	-6.58E-02	-9.77E-03	5.43E-04
3323.48750	-6.	7 5 3	6 6 0	5.00E-06	10.	4.66E-06	6.7	1.31E-03	6.61E-04	1.87E-04
3323.57980	82.	7 5 2	6 6 1	1.53E-05	3.	1.39E-05	9.0	2.27E-03	1.14E-03	3.27E-04
3324.00634	9.	7 3 5	7 2 6	8.88E-04	2.	8.66E-04	2.5	2.45E-02	4.64E-03	2.96E-04
3324.54110	8.	9 0 9	8 1 8	5.65E-03	2.	5.61E-03	.7	6.84E-02	6.46E-03	2.93E-05
3324.86730	2.	9 1 9	8 0 8	1.90E-03	2.	1.87E-03	1.6	-3.95E-02	-3.73E-03	-1.13E-05
3326.22420	33.	10 4 6	10 3 7	2.81E-05	10.	2.59E-05	7.7	4.39E-03	6.46E-04	5.36E-05
3326.42480	1.	7 1 6	6 2 5	5.80E-03	3.	5.91E-03	-1.9	6.74E-02	9.14E-03	3.59E-04
3326.66710	70.	8 4 4	7 5 3	1.30E-05	5.	1.28E-05	1.2	2.54E-03	8.93E-04	1.52E-04
3326.84700	15.	13 3 10	14 2 13	1.95E-05	4.	2.19E-05	-12.5	5.56E-05	4.36E-03	2.69E-04
3327.57072	5.	8 2 7	8 1 8	1.29E-03	5.	1.26E-03	2.1	3.03E-02	5.25E-03	-1.54E-05
3328.87554	-9.	9 4 5	9 3 6	2.45E-04	2.	2.48E-04	-1.3	1.32E-02	2.28E-03	2.80E-04
3331.16400	-149.	11 4 7	11 3 8	2.00E-05	10.	2.09E-05	-4.4	4.02E-03	4.60E-04	8.31E-05
3332.13230	-19.	8 3 5	7 4 4	8.10E-05	4.	7.22E-05	10.9	6.70E-03	1.40E-03	3.96E-04
3336.15540	1.	8 4 4	8 3 5	9.20E-05	3.	8.88E-05	3.5	9.86E-03	-1.28E-03	8.47E-04
3336.40860	-100.	10 5 6	11 2 9	1.50E-05	8.	1.40E-05	6.8	-7.96E-04	-2.23E-03	-7.10E-04
3336.71326	2.	6 2 5	5 1 4	1.14E-02	2.	1.15E-02	-1.1	-9.51E-02	-1.28E-02	6.46E-04
3338.98627	8.	8 3 6	8 2 7	1.08E-03	3.	1.10E-03	-2.2	2.81E-02	4.77E-03	3.74E-04
3340.14170	-4.	10 0 10	9 1 9	8.85E-04	2.	8.83E-04	.3	2.76E-02	2.13E-03	1.39E-05
3340.29838	-11.	10 1 10	9 0 9	2.68E-03	4.	2.65E-03	1.2	-4.77E-02	-3.69E-03	-2.06E-05
3340.63360	-10.	12 5 8	13 2 11	2.61E-05	3.	2.74E-05	-5.1	-3.27E-04	5.97E-03	-4.02E-04
3342.62632	51.	10 3 8	11 0 11	1.80E-05	10.	2.14E-05	-18.8	-1.29E-03	-2.39E-03	-9.43E-04
3342.98188	-10.	9 1 8	9 0 9	5.10E-04	3.	5.08E-04	.5	1.94E-02	3.12E-03	-3.45E-05
3343.72270	-7.	11 3 8	11 2 9	2.75E-05	4.	2.57E-05	6.6	4.57E-03	3.95E-04	1.01E-04
3344.58570	-1.	9 4 6	8 5 3	9.27E-06	2.	9.57E-06	-3.2	2.14E-03	6.92E-04	2.66E-04
3345.67250	30.	9 5 5	10 2 8	5.86E-06	2.	6.90E-06	-17.7	-7.16E-04	-1.39E-03	-5.20E-04
3346.03775	8.	7 4 3	7 3 4	1.47E-03	3.	1.47E-03	-.2	3.14E-02	6.16E-03	8.51E-04
3347.24160	2.	12 4 9	13 1 12	4.30E-05	3.	4.24E-05	1.4	-1.91E-04	-5.81E-03	-5.15E-04
3347.30600	90.	4 4 1	5 1 4	2.72E-05	5.	2.78E-05	-2.3	-3.08E-03	-1.62E-03	-5.76E-04
3347.80580	13.	11 2 9	12 1 12	1.12E-05	4.	1.29E-05	-15.0	7.18E-04	2.16E-03	7.09E-04
3347.84030	9.	8 5 4	7 6 1	1.40E-05	3.	1.46E-05	-4.6	2.35E-03	1.13E-03	3.55E-04
3348.03064	-13.	9 2 8	9 1 9	1.69E-04	3.	1.71E-04	-1.1	1.13E-02	1.81E-03	-9.38E-06
3351.19876	1.	10 2 8	10 1 9	4.55E-05	3.	4.45E-05	2.2	5.90E-03	6.93E-04	7.89E-05
3351.26201	10.	7 2 6	6 1 5	2.43E-03	3.	2.38E-03	2.0	-4.37E-02	-5.29E-03	2.00E-04
3353.22984	9.	8 1 7	7 2 6	1.17E-03	2.	1.19E-03	-1.4	3.08E-02	3.54E-03	1.20E-04
3353.66080	9.	4 2 2	3 1 3	3.43E-03	3.	3.39E-03	1.1	-5.15E-02	-7.67E-03	9.18E-04
3354.50397	13.	6 4 2	6 3 3	9.45E-04	2.	9.56E-04	-1.1	2.49E-02	5.31E-03	7.44E-04
3354.60590	10.	9 7 2	10 6 5	2.15E-06	5.	2.41E-06	-12.0	6.53E-04	4.99E-04	4.00E-04
3355.18740	7.	11 0 11	10 1 10	1.10E-03	5.	1.14E-03	-3.3	3.18E-02	1.91E-03	1.86E-05
3355.26415	-7.	11 1 11	10 0 10	3.77E-04	3.	3.77E-04	0	-1.83E-02	-1.10E-03	-1.01E-05
3356.53135	8.	8 2 6	7 3 5	2.85E-04	2.	2.96E-04	-4.0	1.48E-02	2.07E-03	3.16E-04
3356.55521	39.	9 3 7	9 2 8	1.37E-04	2.	1.37E-04	-.2	1.01E-02	1.45E-03	1.64E-04
3356.62820	22.	9 4 5	8 5 4	3.22E-05	2.	3.30E-05	-2.6	4.11E-03	1.18E-03	4.54E-04
3360.17503	21.	5 4 1	5 3 2	4.37E-03	2.	4.44E-03	-1.7	5.29E-02	1.20E-02	1.69E-03
3362.11312	-9.	8 5 4	9 2 7	2.27E-05	2.	2.67E-05	-17.4	-1.62E-03	-2.50E-03	-1.03E-03
3362.93345	1.	4 4 0	4 3 1	1.51E-03	3.	1.54E-03	-1.8	3.08E-02	7.37E-03	1.04E-03
3363.87708	4.	3 3 0	3 0 3	3.82E-04	3.	3.83E-04	-.2	-1.55E-02	-3.69E-03	-3.55E-04
3364.24581	7.	4 4 1	4 3 2	4.68E-03	2.	4.65E-03	.6	5.36E-02	1.28E-02	1.82E-03
3364.34719	0.	3 3 1	2 2 0	1.06E-02	3.	1.07E-02	-1.3	-8.89E-02	-1.53E-02	6.23E-04
3364.90481	4.	5 4 2	5 3 3	1.55E-03	3.	1.52E-03	1.8	3.10E-02	7.04E-03	1.02E-03
3365.73713	8.	3 3 0	2 2 1	3.27E-02	3.	3.23E-02	1.3	-1.54E-01	-2.65E-02	1.11E-03
3365.85998	-3.	10 1 9	10 0 10	6.44E-05	3.	6.29E-05	2.4	6.92E-03	1.02E-03	-1.13E-05
3366.53660	29.	6 4 3	6 3 4	3.05E-03	3.	3.03E-03	.5	4.43E-02	9.39E-03	1.42E-03
3367.51928	-1.	8 2 7	7 1 6	3.92E-03	2.	3.94E-03	-.4	-5.68E-02	-6.04E-03	1.39E-04
3368.67790	-6.	10 2 9	10 1 10	1.92E-04	3.	1.90E-04	.8	1.20E-02	1.77E-03	-1.27E-05
3369.71632	-18.	12 0 12	11 1 11	1.52E-04	3.	1.46E-04	3.9	1.16E-02	5.04E-04	7.83E-06

Table 8 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)%	Z(020)	Z(100)	Z(001)
3369.75526	-8.	12 1 12	11 0 11	4.38E-04	2.	4.39E-04	-.3	-2.01E-02	-8.73E-04	-1.32E-05
3369.87518	1.	7 4 4	7 3 5	5.28E-04	2.	5.30E-04	-.4	1.88E-02	3.63E-03	6.03E-04
3371.09574	7.	9 3 6	8 4 5	1.09E-04	3.	1.16E-04	-6.4	8.77E-03	1.51E-03	4.80E-04
3371.99900	8.	9 5 5	8 6 2	3.00E-06	10.	3.04E-06	-1.5	1.08E-03	4.97E-04	1.71E-04
3373.05060	0.	9 5 4	8 6 3	9.26E-06	2.	9.20E-06	.7	1.89E-03	8.40E-04	3.06E-04
3375.42330	1.	12 2 10	13 1 13	1.03E-04	2.	1.10E-04	-6.8	-3.30E-05	1.02E-02	3.22E-04
3375.61936	3.	8 4 5	8 3 6	7.08E-04	2.	6.92E-04	2.3	2.19E-02	3.69E-03	7.29E-04
3376.10188	15.	10 3 8	10 2 9	1.35E-04	2.	1.34E-04	1.0	1.03E-02	1.04E-03	2.25E-04
3376.67460	34.	4 3 1	4 0 4	2.58E-04	3.	2.59E-04	-.4	-1.28E-02	-2.98E-03	-3.09E-04
3377.55017	6.	9 1 8	8 2 7	1.84E-03	2.	1.83E-03	-.5	3.90E-02	3.69E-03	1.17E-04
3379.99200	145.	8 6 3	7 7 0	2.52E-06	4.	2.00E-06	20.5	7.46E-04	5.26E-04	1.43E-04
3380.80555	4.	11 2 9	11 1 10	3.65E-05	3.	3.70E-05	-1.4	5.73E-03	2.13E-04	1.42E-04
3383.75780	-28.	13 0 13	12 1 12	1.47E-04	3.	1.54E-04	-5.0	1.21E-02	3.32E-04	9.24E-06
3383.77780	-19.	13 1 13	12 0 12	5.10E-05	3.	5.16E-05	-1.2	-6.99E-03	-1.92E-04	-5.27E-06
3384.26580	-19.	9 4 6	9 3 7	8.42E-05	3.	8.47E-05	-.6	7.87E-03	1.05E-03	2.89E-04
3385.35048	5.	9 2 8	8 1 7	6.60E-04	4.	6.41E-04	2.9	-2.32E-02	-2.10E-03	1.77E-05
3385.70981	15.	4 3 2	3 2 1	1.97E-02	2.	2.07E-02	-4.9	-1.26E-01	-1.90E-02	1.73E-03
3387.21188	-3.	12 3 10	13 0 13	3.03E-05	3.	3.36E-05	-10.9	-5.40E-04	7.06E-03	-7.27E-04
3389.26170	12.	11 2 10	11 1 11	1.96E-05	3.	2.13E-05	-8.6	4.07E-03	5.44E-04	-4.95E-06
3392.42560	0.	4 3 1	3 2 2	6.92E-03	2.	6.86E-03	-.8	-7.31E-02	-1.09E-02	1.10E-03
3393.42608	-7.	9 2 7	8 3 6	4.79E-04	2.	4.93E-04	-2.9	1.97E-02	2.19E-03	3.36E-04
3393.52800	-33.	15 3 12	16 2 15	1.36E-05	4.	1.23E-05	9.2	4.47E-05	-1.22E-04	3.59E-03
3396.00305	4.	10 4 7	10 3 8	7.90E-05	4.	7.87E-05	.3	7.93E-03	5.93E-04	3.49E-04
*3397.34550	-256.	14 1 14	13 0 13	6.82E-05	6.	6.63E-05	2.7	-8.04E-03	-9.51E-05	-6.77E-06
3397.38318	10.	5 3 2	5 0 5	7.24E-04	2.	7.19E-04	-.7	-2.14E-02	-4.88E-03	-5.81E-04
3400.00681	5.	10 1 9	9 2 8	2.68E-04	3.	2.73E-04	-1.9	1.53E-02	1.15E-03	3.94E-05
3401.16930	-58.	11 5 6	11 4 7	1.15E-05	7.	1.04E-05	9.9	2.88E-03	2.37E-04	1.03E-04
3402.08377	-1.	5 2 3	4 1 4	4.54E-03	2.	4.43E-03	2.5	-6.08E-02	-7.50E-03	1.79E-03
3403.71310	-23.	5 3 3	4 2 2	4.03E-03	3.	4.01E-03	.4	-5.70E-02	-7.41E-03	1.06E-03
3404.14825	0.	10 2 9	9 1 8	8.53E-04	2.	8.41E-04	1.4	-2.70E-02	-1.96E-03	-1.13E-05
*3410.48050	-16.	15 0 15	14 1 14	2.00E-05	7.	1.94E-05	3.2	4.40E-03	-9.85E-06	4.90E-06
3414.92840	-52.	6 5 2	7 2 5	1.70E-05	5.	1.35E-05	20.5	-1.46E-03	-1.74E-03	-4.81E-04
3418.45555	18.	6 3 4	5 2 3	6.12E-03	3.	6.51E-03	-6.4	-7.40E-02	-8.30E-03	1.55E-03
3419.13150	64.	12 3 10	12 2 11	3.22E-05	3.	3.50E-05	-8.8	2.94E-03	2.87E-03	1.14E-04
3421.18462	0.	11 1 10	10 2 9	3.22E-04	2.	3.25E-04	-.8	1.70E-02	9.48E-04	4.14E-05
3422.36682	12.	5 3 2	4 2 3	1.14E-02	3.	1.14E-02	.3	-9.68E-02	-1.21E-02	2.29E-03
3423.36084	-20.	11 2 10	10 1 9	1.10E-04	10.	1.10E-04	.3	-9.92E-03	-5.39E-04	-1.23E-05
3424.42662	-8.	9 5 4	9 4 5	1.29E-04	3.	1.27E-04	1.8	9.15E-03	1.46E-03	6.42E-04
3427.09740	34.	6 3 3	6 0 6	1.33E-04	3.	1.37E-04	-2.7	-9.28E-03	-2.10E-03	-3.09E-04
3427.98500	-66.	10 2 8	9 3 7	7.50E-05	6.	7.76E-05	-3.4	8.02E-03	6.82E-04	1.01E-04
3430.42030	1.	3 3 1	2 0 2	1.14E-04	5.	1.05E-04	8.2	8.89E-03	1.48E-03	-1.44E-04
3430.84110	13.	7 3 5	6 2 4	1.11E-03	3.	1.11E-03	.2	-3.09E-02	-3.00E-03	6.39E-04
3432.59100	-10.	8 5 3	8 4 4	1.10E-04	4.	1.14E-04	-3.4	8.46E-03	1.64E-03	5.59E-04
3437.39990	8.	7 5 2	7 4 3	7.50E-04	3.	7.64E-04	-1.9	2.14E-02	4.88E-03	1.41E-03
3439.58102	25.	6 5 1	6 4 2	4.20E-04	3.	4.47E-04	-6.4	1.59E-02	4.20E-03	1.04E-03
3440.17156	0.	5 5 0	5 4 1	1.57E-03	2.	1.61E-03	-2.4	2.89E-02	9.60E-03	1.62E-03
3440.38920	-8.	5 5 1	5 4 2	4.98E-04	3.	4.91E-04	1.4	1.68E-02	4.12E-03	1.24E-03
3440.61402	6.	6 5 2	6 4 3	1.26E-03	2.	1.19E-03	5.4	2.77E-02	6.01E-03	8.37E-04
3440.80205	5.	7 5 3	7 4 4	2.45E-04	3.	2.45E-04	-.2	1.25E-02	2.27E-03	9.11E-04
3441.32630	12.	8 5 4	8 4 5	3.28E-04	3.	3.33E-04	-1.4	1.51E-02	2.04E-03	1.13E-03
3441.49780	49.	12 1 11	11 2 10	3.51E-05	10.	3.84E-05	-9.4	5.97E-03	2.15E-04	1.49E-05
3442.17688	30.	8 3 6	7 2 5	1.59E-03	3.	1.60E-03	-.7	-3.75E-02	-3.14E-03	6.73E-04
3442.64300	31.	12 2 11	11 1 10	1.10E-04	4.	1.16E-04	-5.6	-1.04E-02	-3.67E-04	-1.91E-05
3442.75700	107.	9 5 5	9 4 6	4.05E-05	5.	4.06E-05	-.3	5.55E-03	3.85E-04	4.40E-04
3444.23250	91.	7 4 3	8 1 8	3.21E-05	10.	3.79E-05	-17.9	-1.31E-03	-3.63E-03	-1.21E-03
3445.73890	88.	10 5 6	10 4 7	3.21E-05	10.	3.51E-05	-9.5	5.68E-03	-2.65E-04	5.10E-04
3454.02827	-27.	9 3 7	8 2 6	2.37E-04	2.	2.38E-04	-.5	-1.46E-02	-1.04E-03	2.02E-04
3457.58502	10.	6 3 3	5 2 4	1.76E-03	2.	1.75E-03	.6	-3.92E-02	-3.92E-03	1.34E-03
3458.05361	-4.	6 2 4	5 1 5	6.04E-04	3.	5.80E-04	4.0	-2.29E-02	-2.22E-03	1.06E-03
3461.10447	10.	4 3 2	3 0 3	8.24E-04	3.	8.14E-04	1.2	2.57E-02	3.63E-03	-7.91E-04
3461.34413	8.	4 4 1	3 3 0	1.92E-02	4.	1.91E-02	.7	-1.22E-01	-1.78E-02	1.41E-03
3461.55660	-1.	4 4 0	3 3 1	6.20E-03	3.	6.37E-03	-2.8	-7.04E-02	-1.03E-02	8.19E-04
3466.10313	6.	8 4 4	9 1 9	4.58E-03	3.	4.62E-03	-1.0	1.52E-03	-6.88E-02	-6.81E-04
3466.59350	18.	7 3 4	7 0 7	1.56E-04	2.	1.67E-04	-6.9	-1.01E-02	-2.31E-03	-4.51E-04
3467.81442	14.	10 3 8	9 2 7	2.82E-04	4.	2.93E-04	-3.8	-1.63E-02	-9.60E-04	1.62E-04
3469.52962	26.	5 4 1	5 1 4	2.01E-04	3.	2.08E-04	-3.3	-1.10E-02	-2.71E-03	-7.43E-04
3471.27820	-72.	4 4 0	4 1 3	2.17E-05	10.	2.50E-05	-15.0	-3.73E-03	-1.01E-03	-2.57E-04
3473.14720	23.	6 4 2	6 1 5	8.00E-05	6.	8.96E-05	-12.0	-7.38E-03	-1.59E-03	-4.88E-04
3484.18026	5.	7 4 3	7 1 6	2.10E-04	8.	1.98E-04	5.6	-1.15E-02	-1.69E-03	-8.98E-04
3485.03049	14.	5 4 2	4 3 1	3.56E-03	3.	3.58E-03	-.7	-5.46E-02	-6.55E-03	1.27E-03
3486.47012	13.	5 4 1	4 3 2	1.08E-02	3.	1.08E-02	-.3	-9.50E-02	-1.14E-02	2.24E-03

Table 8 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(020)	Z(100)	Z(001)
3497.44032	22.	5 3 3	4 0 4	3.26E-04	3.	3.19E-04	2.2	1.67E-02	1.96E-03	-8.07E-04
3497.60126	-8.	5 5 0	6 2 5	5.57E-04	2.	6.67E-04	-19.8	-1.41E-03	2.64E-02	8.41E-04
3499.92550	2.	7 3 4	6 2 5	2.03E-03	4.	2.01E-03	1.1	-4.37E-02	-3.22E-03	2.12E-03
3503.42298	25.	8 4 4	8 1 7	5.28E-04	3.	5.28E-04	.0	-4.70E-03	2.86E-02	-8.87E-04
3506.70319	24.	6 4 3	5 3 2	5.45E-03	3.	5.37E-03	1.5	-6.91E-02	-6.55E-03	2.33E-03
3512.08440	-25.	6 4 2	5 3 3	1.80E-03	10.	1.82E-03	-1.3	-4.04E-02	-3.78E-03	1.45E-03
3514.49890	7.	13 2 11	12 3 10	8.00E-06	8.	9.78E-06	-22.3	3.10E-03	-1.37E-05	4.60E-05
3515.81253	-19.	8 3 5	8 0 8	1.53E-05	3.	1.81E-05	-18.5	-3.27E-03	-7.78E-04	-2.08E-04
3518.44755	-6.	6 6 1	6 5 2	5.07E-04	2.	5.05E-04	.3	1.35E-02	-6.21E-03	1.52E-02
3518.52510	11.	6 6 0	6 5 1	1.80E-04	2.	1.96E-04	-8.9	7.71E-03	7.25E-03	-9.61E-04
3519.03389	-17.	9 6 3	9 5 4	4.17E-04	5.	3.69E-04	11.4	3.91E-03	2.08E-02	-5.52E-03
3519.14253	5.	7 6 1	7 5 2	4.93E-04	3.	5.54E-04	-12.4	1.19E-02	1.38E-02	-2.15E-03
3519.17660	1.	8 6 2	8 5 3	1.20E-04	4.	1.31E-04	-9.4	4.86E-03	8.41E-03	-1.81E-03
3519.23568	8.	7 6 2	7 5 3	1.55E-04	3.	1.70E-04	-9.4	7.05E-03	4.04E-03	1.93E-03
3519.63780	-20.	8 6 3	8 5 4	2.93E-04	2.	2.89E-04	1.5	9.00E-03	6.32E-03	1.67E-03
3519.66745	100.	10 6 5	10 5 6	4.15E-05	3.	4.41E-05	-6.3	3.59E-03	2.51E-03	5.36E-04
3519.72140	-33.	9 6 4	9 5 5	4.17E-05	4.	4.27E-05	-2.3	3.42E-03	2.49E-03	6.16E-04
3520.23623	15.	7 2 5	6 1 6	6.56E-04	2.	6.43E-04	2.0	-2.54E-02	-1.81E-03	1.81E-03
3525.02075	25.	7 4 4	6 3 3	7.52E-04	2.	7.88E-04	-4.7	-2.72E-02	-1.96E-03	1.12E-03
3528.72470	11.	7 6 2	8 3 5	2.08E-04	3.	2.20E-04	-6.0	-2.16E-04	1.09E-03	-1.57E-02
3532.71520	5.	9 4 5	9 1 8	5.85E-05	3.	6.04E-05	-3.3	-5.05E-03	-1.93E-03	-7.96E-04
3539.37888	20.	8 4 5	7 3 4	9.33E-04	2.	9.34E-04	-.1	-3.04E-02	-1.58E-03	1.37E-03
3539.41550	-6.	7 4 3	6 3 4	2.50E-03	4.	2.43E-03	2.9	-4.83E-02	-3.33E-03	2.33E-03
3539.61824	10.	6 3 4	5 0 5	7.25E-04	3.	7.06E-04	2.7	2.60E-02	2.43E-03	-1.85E-03
3542.24751	11.	5 4 2	5 1 5	1.55E-05	5.	1.68E-05	-8.2	-2.84E-03	-9.62E-04	-2.93E-04
3542.35150	-3.	10 6 4	11 3 9	1.37E-05	4.	1.41E-05	-3.1	-3.44E-05	-8.26E-04	-2.90E-03
3550.20331	13.	9 6 3	10 3 8	9.05E-04	3.	9.48E-04	-4.8	-3.66E-04	6.63E-03	2.45E-02
3550.26825	8.	8 3 5	7 2 6	2.20E-04	2.	2.16E-04	1.8	-1.51E-02	-6.77E-04	1.04E-03
3550.34000	42.	9 4 6	8 3 5	1.25E-04	6.	1.14E-04	9.1	-1.08E-02	-3.81E-04	4.94E-04
3558.85727	40.	8 6 2	9 3 7	2.03E-04	2.	2.10E-04	-3.3	-2.31E-04	2.84E-03	1.19E-02
3559.21243	28.	10 4 7	9 3 6	1.14E-04	6.	1.17E-04	-2.5	-1.10E-02	-2.52E-04	4.89E-04
3562.36950	-4.	5 5 1	4 4 0	2.56E-03	2.	2.52E-03	1.7	-4.57E-02	-5.30E-03	8.46E-04
3562.40485	-18.	5 5 0	4 4 1	7.50E-03	5.	7.37E-03	1.7	-7.87E-02	-8.26E-03	1.14E-03
3564.68970	-6.	6 6 1	7 3 4	3.50E-02	5.	3.32E-02	5.2	-1.44E-05	-5.54E-03	-1.77E-01
3572.86206	7.	7 6 1	8 3 6	6.74E-04	3.	6.75E-04	-.1	-4.07E-04	4.66E-03	2.17E-02
3573.39720	38.	4 4 1	3 1 2	6.11E-05	2.	6.25E-05	-2.4	7.03E-03	1.15E-03	-2.69E-04
3576.32700	-177.	12 4 9	11 3 8	8.70E-06	10.	1.02E-05	-17.0	-3.27E-03	-3.29E-04	4.09E-04
3586.22720	10.	7 5 2	7 2 5	9.80E-05	3.	1.12E-04	-14.6	-4.10E-03	-5.62E-03	-8.76E-04
3586.99750	-8.	6 5 2	5 4 1	3.90E-03	4.	3.85E-03	1.2	-5.81E-02	-4.89E-03	9.39E-04
3587.24662	9.	6 5 1	5 4 2	1.23E-03	2.	1.23E-03	.2	-3.36E-02	-2.55E-03	1.14E-03
3590.46368	28.	6 6 0	7 3 5	2.34E-04	2.	2.36E-04	-.9	-1.90E-04	2.36E-03	1.32E-02
3594.58785	39.	6 5 1	6 2 4	5.27E-05	2.	6.34E-05	-20.3	-1.88E-03	-5.76E-03	-3.26E-04
*3595.99900	74.	7 7 0	7 6 1	8.50E-05	10.	1.01E-04	-19.1	6.59E-03	2.72E-03	7.52E-04
3604.00231	26.	5 5 0	5 2 3	8.44E-04	2.	1.02E-03	-20.6	-1.15E-03	-3.11E-02	3.39E-04
3604.49760	13.	4 4 0	3 1 3	1.14E-05	2.	1.02E-05	10.2	2.81E-03	5.39E-04	-1.47E-04
3605.67910	30.	9 4 5	8 3 6	3.15E-04	10.	2.93E-04	6.9	-1.84E-02	-8.19E-05	1.40E-03
3608.20422	23.	9 3 6	8 2 7	1.75E-04	2.	1.79E-04	-2.4	-1.47E-02	-2.00E-04	1.48E-03
3610.76596	25.	7 5 3	6 4 2	5.48E-04	2.	5.39E-04	1.6	-2.33E-02	-1.26E-03	1.30E-03
3611.09400	-120.	6 5 2	7 0 7	1.45E-05	4.	1.31E-05	9.7	2.11E-04	-3.42E-05	-3.79E-03
3611.91220	6.	7 5 2	6 4 3	1.71E-03	4.	1.60E-03	6.2	-4.04E-02	-1.76E-03	2.08E-03
3616.05800	52.	6 4 3	5 1 4	2.45E-04	4.	2.48E-04	-1.3	1.56E-02	1.48E-03	-1.28E-03
3632.79782	21.	8 5 4	7 4 3	6.09E-04	2.	6.21E-04	-1.9	-2.62E-02	-6.99E-04	1.94E-03
3636.62200	-77.	8 5 3	7 4 4	1.94E-04	10.	2.07E-04	-6.6	-1.53E-02	-1.71E-04	1.05E-03
3637.57280	20.	8 4 5	8 1 8	1.56E-05	5.	1.90E-05	-22.1	-2.70E-03	-1.16E-03	-5.04E-04
3638.34290	4.	8 3 6	7 0 7	1.67E-04	4.	1.68E-04	-.7	1.43E-02	7.46E-04	-2.10E-03
3643.66389	26.	7 4 4	6 1 5	7.50E-05	3.	7.48E-05	.3	9.11E-03	5.87E-04	-1.05E-03
3644.14868	19.	5 4 1	4 1 4	5.26E-05	2.	5.37E-05	-2.0	6.80E-03	1.20E-03	-6.83E-04
3648.14195	-15.	10 4 6	9 3 7	2.47E-05	2.	2.65E-05	-7.1	-5.82E-03	1.65E-04	5.14E-04
3651.86548	24.	9 5 5	8 4 4	7.16E-05	2.	6.95E-05	2.9	-9.15E-03	-2.85E-05	8.38E-04
3655.37942	0.	9 2 7	8 1 8	6.90E-05	4.	7.29E-05	-5.7	-9.93E-03	-2.77E-04	1.67E-03
3658.93840	72.	7 5 3	7 2 6	7.93E-06	3.	9.10E-06	-14.8	-1.54E-03	-1.22E-03	-2.57E-04
3661.95350	0.	9 5 4	8 4 5	2.13E-04	2.	2.08E-04	2.2	-1.62E-02	3.62E-04	1.46E-03
3664.96995	-12.	6 6 1	5 5 0	1.63E-03	3.	1.69E-03	-3.6	-4.17E-02	-4.92E-03	5.53E-03
3665.08455	-7.	6 6 0	5 5 1	6.53E-04	3.	6.72E-04	-2.9	-2.50E-02	-5.98E-04	-3.22E-04
3666.83870	5.	10 5 6	9 4 5	6.12E-05	3.	6.16E-05	-.7	-8.95E-03	1.11E-04	9.88E-04
3672.34740	-8.	10 3 7	9 2 8	1.59E-05	4.	1.44E-05	9.3	-4.58E-03	9.44E-05	6.90E-04
3689.42780	52.	6 4 2	5 1 5	1.57E-05	3.	1.80E-05	-14.4	3.99E-03	7.48E-04	-4.98E-04
3692.87666	7.	9 3 7	8 0 8	1.98E-05	3.	2.03E-05	-2.6	5.45E-03	2.19E-04	-1.16E-03
3698.28100	36.	11 4 7	10 3 8	1.70E-05	2.	1.63E-05	4.1	-5.09E-03	3.65E-04	6.88E-04
3702.83240	9.	6 6 1	7 1 6	1.13E-04	5.	1.08E-04	4.3	2.75E-05	-1.17E-04	1.05E-02
3714.96933	2.	8 6 3	7 5 2	2.87E-04	3.	2.78E-04	3.1	-1.96E-02	1.82E-03	1.13E-03

Table 8 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t	Z(020)	Z(100)	Z(001)
3715.44167	19.	8 6 2	7 5 3	9.92E-05	3.	9.96E-05	-4.	-1.11E-02	2.50E-03	-1.39E-03
3717.60730	38.	9 4 6	8 1 7	1.95E-05	3.	1.92E-05	1.6	5.44E-03	4.99E-05	-1.11E-03
3725.16493	11.	5 5 0	5 0 5	2.75E-04	3.	3.38E-04	-22.8	1.37E-03	-1.94E-02	-3.13E-04
3745.60910	37.	6 6 0	6 3 3	2.30E-04	3.	2.51E-04	-8.9	-7.22E-04	5.50E-03	1.10E-02
3758.06760	-6.	6 6 1	6 3 4	2.70E-02	3.	2.68E-02	.7	4.63E-05	-1.28E-02	-1.51E-01
*3767.13480	-2.	7 7 0	6 6 1	4.92E-04	3.	5.35E-04	-8.8	-2.41E-02	5.46E-04	4.39E-04
3791.10370	15.	11 2 9	10 1 10	3.80E-06	7.	4.67E-06	-23.0	-3.42E-03	-2.55E-04	1.51E-03
3799.83402	15.	8 4 4	7 1 7	1.45E-03	2.	1.44E-03	.8	-1.86E-03	4.06E-02	-8.40E-04
3812.76700	-36.	12 5 8	12 2 11	7.00E-06	10.	6.56E-06	6.3	-4.18E-04	2.91E-03	6.50E-05
3817.93480	-2.	9 7 3	8 6 2	1.30E-05	4.	1.25E-05	3.8	-4.81E-03	8.58E-04	4.11E-04
3817.96755	18.	9 7 2	8 6 3	4.05E-05	2.	3.75E-05	7.4	-8.32E-03	1.49E-03	7.14E-04
3842.56500	-102.	10 7 3	9 6 4	2.90E-06	10.	3.15E-06	-8.7	-2.77E-03	7.29E-04	2.67E-04
*3866.65660	-30.	8 8 1	7 7 0	7.20E-05	10.	7.72E-05	-7.3	-1.08E-02	1.98E-03	4.40E-05
3871.99120	36.	6 5 2	5 0 5	4.14E-05	2.	4.14E-05	.1	-9.43E-04	1.95E-04	-5.68E-03
3874.76410	22.	7 6 1	7 1 6	1.25E-04	3.	1.22E-04	2.5	3.35E-04	-1.51E-03	-9.87E-03
3892.19830	50.	8 6 2	8 1 7	4.50E-05	4.	4.20E-05	6.7	2.08E-04	-8.64E-04	-5.82E-03
3898.23430	0.	6 6 1	5 3 2	7.40E-02	3.	6.97E-02	5.8	2.09E-04	5.60E-03	-2.70E-01
3903.18980	26.	6 6 0	5 3 3	3.50E-04	2.	3.36E-04	3.9	1.14E-03	-2.67E-03	1.99E-02
3929.99945	22.	7 6 1	6 3 4	1.37E-03	3.	1.27E-03	7.2	2.37E-03	-3.05E-03	3.63E-02
3932.44850	33.	8 6 3	7 3 4	3.20E-04	6.	3.66E-04	-14.3	1.96E-03	-1.21E-03	-1.99E-02
3955.46660	45.	10 6 5	9 3 6	1.30E-05	10.	1.50E-05	-15.1	1.36E-03	-4.96E-04	-4.73E-03
3958.39407	18.	8 6 2	7 3 5	5.12E-04	2.	5.00E-04	2.3	1.36E-03	-5.59E-04	2.16E-02
3959.79430	30.	6 6 1	6 1 6	1.19E-04	3.	1.16E-04	2.1	3.41E-05	-5.56E-04	1.13E-02
3983.76244	11.	14 3 12	13 0 13	1.06E-04	2.	9.20E-05	13.2	5.04E-04	-1.99E-04	-9.89E-03
4007.58900	17.	6 6 1	5 1 4	6.35E-03	2.	6.51E-03	-2.5	-5.25E-05	9.04E-04	-8.15E-02
4018.00805	10.	15 3 12	14 2 13	1.14E-04	2.	1.05E-04	8.3	-2.34E-04	6.88E-05	1.04E-02
4021.18900	7.	10 6 4	9 3 7	4.46E-05	3.	4.74E-05	-6.2	3.18E-04	-1.36E-03	-5.84E-03
4035.97683	35.	7 6 2	6 1 5	8.73E-05	3.	8.52E-05	2.4	-2.04E-04	6.11E-05	-9.09E-03
4070.59120	49.	8 6 3	7 1 6	6.83E-05	2.	6.88E-05	-.7	-3.97E-04	-2.72E-04	-7.62E-03
4131.72600	43.	7 6 1	6 1 6	1.32E-05	4.	1.42E-05	-7.6	-6.75E-05	-5.23E-04	4.36E-03
4159.30600	32.	10 6 5	9 1 8	9.30E-06	10.	7.75E-06	16.7	-1.57E-04	-4.14E-04	-2.21E-03
4260.40872	23.	12 5 8	11 0 11	3.95E-05	3.	3.00E-05	24.1	-6.97E-05	-2.65E-03	-2.75E-03

Computed frequencies ( $\text{cm}^{-1}$ ) derived from energy levels given in ref. 1 for the (000) state and Table 1 for the upper state. o-c, observed minus computed  $\times 10^5$

(o-c)t, observed minus computed line strengths given in percent. Computed values are derived from constants obtained in this work.

Z(020), Z(100), Z(001) are the contributions of the three states from which the computed strengths are derived:

$$S(\text{calc.}) = [Z(020) + Z(100) + Z(001)]^2$$

**Table 9. Observed and computed line strengths (cm<sup>-2</sup>/atm. at 296K) of the (100)-(000) band of H<sub>2</sub><sup>16</sup>O**

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c) <sup>t</sup>	Z(100)	Z(020)	Z(001)
2912.37600	-45.	8 0 8	9 5 5	2.10E-05	10.	1.90E-05	9.6	-1.49E-03	-2.97E-03	1.03E-04
2937.84940	-7.	12 1 12	13 2 11	6.26E-06	10.	5.66E-06	9.5	1.66E-03	4.17E-04	3.01E-04
2981.75580	-43.	7 4 3	8 7 2	8.22E-06	6.	7.55E-06	8.2	-2.42E-03	-9.80E-04	6.49E-04
2984.60800	66.	12 2 11	13 3 10	1.80E-06	10.	1.90E-06	-5.5	1.36E-03	-3.65E-04	3.86E-04
2996.39445	15.	11 0 11	12 3 10	1.15E-05	8.	1.17E-05	-1.5	-2.97E-03	1.54E-04	-5.95E-04
2998.72930	-7.	11 1 11	12 2 10	4.30E-06	10.	3.62E-06	15.9	1.68E-03	-1.26E-04	3.48E-04
2999.65100	87.	6 4 3	7 7 0	3.30E-06	10.	3.52E-06	-6.8	-1.64E-03	-3.66E-04	1.29E-04
3004.47760	-57.	5 1 4	6 6 1	1.79E-05	6.	1.43E-05	20.3	1.90E-03	2.01E-03	-1.33E-04
3005.25550	-54.	11 3 8	12 6 7	2.50E-06	4.	2.80E-06	-12.0	-1.53E-03	4.36E-05	-1.84E-04
3007.12700	-83.	6 4 2	7 7 1	2.50E-06	10.	2.26E-06	9.5	-1.26E-03	-5.81E-04	3.33E-04
3026.44000	-159.	10 3 7	11 6 6	1.67E-06	10.	1.87E-06	-11.7	-1.33E-03	3.92E-05	-7.85E-05
3026.82740	-12.	8 1 8	9 4 5	8.61E-06	10.	8.35E-06	3.0	-2.95E-03	8.63E-05	-2.70E-05
3028.23704	0.	11 1 10	12 4 9	1.62E-05	3.	1.60E-05	1.0	-3.38E-03	8.41E-05	-7.13E-04
3041.43150	19.	11 2 9	12 5 8	1.25E-05	5.	1.16E-05	7.4	-2.89E-03	6.57E-05	-5.82E-04
3043.26180	2.	9 3 6	10 6 5	8.30E-06	4.	8.69E-06	-4.7	-3.07E-03	9.72E-05	2.62E-05
3045.69660	23.	12 3 10	13 4 9	5.92E-06	3.	5.22E-06	11.8	1.58E-03	3.24E-04	3.83E-04
3046.17650	-31.	7 3 5	8 6 2	3.80E-06	15.	3.59E-06	5.7	-2.22E-03	1.05E-04	2.17E-04
3047.66700	48.	11 2 10	12 3 9	5.50E-06	10.	5.67E-06	-3.1	2.00E-03	-9.72E-05	4.73E-04
3055.29350	2.	10 0 10	11 3 9	1.55E-05	5.	1.45E-05	6.5	-3.29E-03	9.28E-05	-6.13E-04
3059.72330	-1.	10 1 10	11 2 9	4.50E-05	4.	4.30E-05	4.4	5.67E-03	-2.11E-04	1.10E-03
3073.38063	-5.	7 3 4	8 6 3	9.80E-06	4.	1.03E-05	-4.8	-4.07E-03	1.55E-04	7.16E-04
3076.71530	-10.	6 3 4	7 6 1	1.05E-05	4.	1.06E-05	-1.3	-4.00E-03	1.78E-04	5.60E-04
3082.75710	-15.	10 1 9	11 4 8	1.90E-05	4.	1.95E-05	-2.5	-3.75E-03	7.64E-05	-7.35E-04
3083.30336	-5.	10 2 8	11 5 7	1.23E-05	5.	1.18E-05	4.0	-2.99E-03	6.65E-05	-5.09E-04
3087.70900	-34.	5 0 5	6 5 2	1.96E-06	10.	2.20E-06	-12.3	1.87E-03	-8.66E-05	-3.03E-04
3093.56980	26.	12 7 6	13 8 5	1.86E-06	10.	1.77E-06	5.0	1.24E-03	-2.70E-05	1.15E-04
*3097.29350	-33.	11 8 3	12 9 4	3.92E-06	3.	4.34E-06	-10.6	1.98E-03	-3.39E-05	1.36E-04
3097.31970	-15.	7 2 6	8 5 3	1.43E-05	2.	1.49E-05	-4.0	-4.04E-03	1.18E-04	6.22E-05
3100.60830	-41.	7 1 7	8 4 4	1.14E-05	5.	1.10E-05	3.5	-3.36E-03	8.63E-05	-4.11E-05
3105.22870	-33.	5 3 3	6 6 0	1.82E-06	10.	1.95E-06	-6.9	-1.81E-03	7.77E-05	3.33E-04
*3107.15080	13.	10 9 2	11 10 1	5.00E-06	10.	5.87E-06	-17.4	2.39E-03	-3.85E-06	4.17E-05
3108.88020	8.	5 3 2	6 6 1	6.60E-06	5.	7.35E-06	-11.4	-3.03E-03	1.19E-04	2.01E-04
3112.70190	-57.	12 4 9	13 5 8	8.60E-06	6.	8.61E-06	-1.	2.24E-03	-2.48E-05	7.21E-04
3113.12352	6.	10 2 9	11 3 8	7.35E-05	2.	7.36E-05	-1.	7.18E-03	-2.23E-04	1.62E-03
3113.57933	-6.	9 0 9	10 3 8	1.43E-04	3.	1.41E-04	1.1	-1.03E-02	1.97E-04	-1.79E-03
3115.23610	-5.	11 3 9	12 4 8	7.63E-06	2.	8.42E-06	-10.4	2.36E-03	-1.16E-04	6.60E-04
3118.98060	-23.	9 2 7	10 5 6	9.10E-05	5.	8.23E-05	9.5	-8.19E-03	1.83E-04	-1.07E-03
3120.89200	130.	11 7 5	12 8 4	2.80E-06	10.	2.62E-06	6.3	1.54E-03	-3.32E-05	1.17E-04
3120.96590	65.	11 7 4	12 8 5	8.60E-06	4.	7.89E-06	8.2	2.66E-03	-5.75E-05	2.06E-04
3121.78350	0.	9 1 9	10 2 8	5.05E-05	4.	4.83E-05	4.3	6.02E-03	-1.66E-04	1.10E-03
3121.90900	169.	12 6 7	13 7 6	3.12E-06	10.	2.50E-06	20.0	1.66E-03	-3.74E-05	-3.77E-05
*3125.18350	24.	10 8 3	11 9 2	1.65E-05	5.	1.70E-05	-3.2	4.02E-03	-6.56E-05	1.68E-04
3131.35017	-32.	12 5 8	13 6 7	1.00E-05	4.	1.00E-05	-3.	2.32E-03	-4.79E-05	8.94E-04
3131.44580	10.	8 0 8	8 5 3	4.36E-05	2.	4.44E-05	-1.9	1.70E-03	4.65E-03	3.21E-04
3134.63075	-21.	9 1 8	10 4 7	1.78E-04	3.	1.85E-04	-3.9	-1.17E-02	2.17E-04	-2.07E-03
*3135.09650	-58.	9 9 0	10 10 1	1.95E-05	4.	2.07E-05	-6.2	4.63E-03	-3.00E-06	-7.30E-05
3139.55545	-9.	6 2 5	7 5 2	6.22E-05	2.	6.50E-05	-4.5	-8.71E-03	2.42E-04	4.09E-04
3147.92533	-4.	8 2 6	9 5 5	4.50E-05	3.	4.60E-05	-2.3	-6.40E-03	1.47E-04	-5.37E-04
3148.29800	15.	11 6 6	12 7 5	4.23E-06	10.	4.72E-06	-11.5	2.15E-03	-4.93E-05	6.70E-05
3148.35040	26.	10 7 4	11 8 3	3.04E-05	3.	3.09E-05	-1.8	5.38E-03	-1.15E-04	3.01E-04
3148.36880	20.	10 7 3	11 8 4	9.11E-06	4.	1.03E-05	-13.2	3.10E-03	-6.63E-05	1.75E-04
3149.26000	-52.	11 6 5	12 7 6	1.52E-05	5.	1.60E-05	-5.4	3.82E-03	-8.72E-05	2.68E-04
*3153.13250	39.	9 8 1	10 9 2	5.35E-05	4.	5.92E-05	-10.7	7.71E-03	-1.19E-04	1.07E-04
3156.69460	33.	13 5 8	14 6 9	1.80E-06	15.	1.57E-06	13.0	1.06E-03	-2.15E-05	2.10E-04
3164.02940	-2.	11 5 7	12 6 6	1.55E-05	3.	1.61E-05	-3.7	2.86E-03	-6.16E-05	1.21E-03
3164.36827	-16.	11 4 8	12 5 7	1.57E-05	3.	1.59E-05	-1.6	3.09E-03	-4.05E-05	9.40E-04
3164.56604	-4.	6 1 6	7 4 3	9.05E-05	3.	8.99E-05	.6	-9.68E-03	2.33E-04	-3.71E-05
3165.70350	-48.	8 4 5	8 7 2	1.33E-06	10.	1.26E-06	5.2	1.25E-03	2.62E-04	-3.92E-04
3170.89958	0.	7 2 5	8 5 4	1.64E-04	3.	1.65E-04	-.6	-1.28E-02	3.02E-04	-3.82E-04
3171.12587	-11.	8 0 8	9 3 7	2.54E-05	3.	2.25E-05	11.5	-6.53E-03	2.72E-03	-9.31E-04
3175.07484	4.	10 6 5	11 7 4	6.05E-05	3.	6.09E-05	-.7	7.67E-03	-1.76E-04	3.12E-04
3175.40150	-79.	10 6 4	11 7 5	2.30E-05	6.	2.11E-05	8.2	4.46E-03	-1.02E-04	2.36E-04
*3175.89920	-65.	9 7 2	10 8 3	1.41E-04	3.	1.44E-04	-1.9	1.18E-02	-2.48E-04	4.02E-04
3176.49895	-27.	5 2 4	6 5 1	2.05E-05	3.	2.05E-05	-.2	-5.10E-03	1.37E-04	4.30E-04
3177.25813	26.	10 3 8	11 4 7	1.33E-04	3.	1.34E-04	-.7	9.39E-03	-2.93E-04	2.48E-03
3178.95503	8.	9 2 8	10 3 7	9.65E-05	2.	9.70E-05	-.5	8.26E-03	-2.12E-04	1.80E-03
*3181.08000	0.	8 8 1	9 9 0	1.68E-04	5.	1.83E-04	-9.2	1.40E-02	-2.04E-04	-2.14E-04
3181.53320	-44.	9 4 5	9 7 2	1.16E-05	5.	9.50E-06	18.1	1.99E-03	1.40E-03	-3.09E-04
3182.70395	-9.	8 1 7	9 4 6	1.59E-04	3.	1.62E-04	-1.9	-1.12E-02	1.97E-04	-1.70E-03
3185.14148	12.	8 1 8	9 2 7	4.41E-04	3.	4.43E-04	-.4	1.83E-02	-4.38E-04	3.18E-03
3187.53393	-6.	11 5 6	12 6 7	2.84E-05	3.	2.97E-05	-4.6	5.09E-03	-1.12E-04	4.72E-04
3189.87758	-19.	6 2 4	7 5 3	4.65E-05	3.	4.78E-05	-2.8	-7.31E-03	1.78E-04	2.24E-04
3190.94189	-7.	10 5 6	11 6 5	1.77E-04	2.	1.81E-04	-2.1	8.72E-03	-1.92E-04	4.91E-03

Table 9 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(100)	Z(020)	Z(001)
3202.01296	20.	9 6 4	10 7 3	7.23E-05	3.	7.34E-05	-1.6	8.47E-03	-1.95E-04	2.91E-04
3202.10341	-4.	9 6 3	10 7 4	2.18E-04	5.	2.22E-04	-2.1	1.47E-02	-3.39E-04	5.58E-04
*3203.46440	12.	8 7 2	9 8 1	4.13E-04	3.	4.43E-04	-7.4	2.13E-02	-4.37E-04	2.11E-04
3207.62900	95.	10 2 9	10 5 6	1.38E-06	10.	1.40E-06	-1.6	1.98E-03	-1.63E-04	-6.38E-04
3209.23850	-27.	4 2 3	5 5 0	3.01E-05	3.	3.12E-05	-3.7	-6.59E-03	1.75E-04	8.28E-04
3219.67618	-9.	5 1 5	6 4 2	5.18E-05	2.	5.33E-05	-2.8	-7.59E-03	1.79E-04	1.11E-04
3224.48570	-60.	4 2 2	5 5 1	1.35E-05	8.	1.38E-05	-2.2	-4.10E-03	1.03E-04	2.81E-04
3225.70612	-1.	7 1 6	8 4 5	1.00E-03	2.	1.00E-03	-3.	-2.87E-02	4.79E-04	-3.48E-03
3226.06850	-5.	7 0 7	8 3 6	1.03E-03	2.	1.00E-03	2.8	-2.83E-02	7.27E-04	-4.04E-03
3229.03950	1.	8 6 3	9 7 2	6.70E-04	3.	6.93E-04	-3.4	2.64E-02	-6.07E-04	5.45E-04
3229.05870	-14.	8 6 2	9 7 3	2.40E-04	3.	2.31E-04	3.7	1.52E-02	-3.51E-04	3.26E-04
*3230.98330	-12.	7 7 0	8 8 1	1.14E-03	3.	1.21E-03	-5.9	3.61E-02	-7.26E-04	-5.79E-04
3232.38840	73.	8 3 6	8 6 3	2.73E-06	15.	2.23E-06	18.4	2.66E-03	-1.69E-04	-1.00E-03
3232.75604	-7.	9 5 4	10 6 5	3.50E-04	5.	3.69E-04	-5.5	1.94E-02	-4.51E-04	2.77E-04
3232.88751	3.	9 5 5	10 6 4	6.04E-05	3.	6.41E-05	-6.2	9.77E-03	-2.28E-04	-1.53E-03
3233.98827	-5.	9 3 7	10 4 6	2.06E-04	2.	2.06E-04	.1	1.18E-02	-3.12E-04	2.87E-03
3239.60460	19.	12 4 8	13 5 9	4.18E-06	3.	4.47E-06	-7.0	1.84E-03	-6.63E-05	3.45E-04
3242.69700	2.	15 3 12	16 4 13	4.40E-07	15.	3.46E-07	21.3	5.69E-04	-1.57E-05	3.51E-05
3243.04507	9.	8 2 7	9 3 6	1.09E-03	2.	1.09E-03	-.2	2.79E-02	-6.65E-04	5.76E-03
3246.55500	-32.	9 4 6	10 5 5	2.89E-04	3.	2.91E-04	-.7	1.37E-02	-2.33E-04	3.58E-03
3247.85300	104.	6 3 4	6 6 1	1.24E-06	10.	1.29E-06	-4.3	2.02E-03	-9.89E-05	-7.89E-04
3249.19622	-10.	11 4 7	12 5 8	5.24E-05	3.	5.20E-05	.8	6.39E-03	-2.48E-04	1.07E-03
3249.47258	2.	7 1 7	8 2 6	4.25E-04	2.	4.22E-04	.7	1.80E-02	-4.07E-04	2.95E-03
*3256.08520	-69.	7 6 1	8 7 2	2.48E-03	4.	2.54E-03	-2.6	5.15E-02	-1.18E-03	1.44E-04
3258.07400	-7.	8 5 4	9 6 3	9.75E-04	3.	9.79E-04	-.4	3.36E-02	-7.97E-04	-1.54E-03
3258.15855	-3.	8 5 3	9 6 4	3.78E-04	3.	3.83E-04	-1.4	2.01E-02	-4.74E-04	-2.31E-05
3261.01540	5.	10 4 6	11 5 7	5.38E-05	3.	5.58E-05	-3.7	6.94E-03	-3.36E-04	8.62E-04
3262.51810	-12.	6 1 5	7 4 4	4.94E-04	2.	4.94E-04	.0	-2.08E-02	3.05E-04	-1.77E-03
3264.35380	-52.	8 1 8	8 4 5	1.05E-05	10.	1.05E-05	-.2	4.76E-03	-2.24E-04	-1.30E-03
3267.23377	-23.	4 1 4	5 4 1	1.68E-04	3.	1.74E-04	-3.4	-1.41E-02	3.35E-04	5.89E-04
3270.79730	-3.	8 2 7	8 5 4	1.02E-05	4.	1.07E-05	-4.5	4.98E-03	-2.16E-04	-1.50E-03
3273.40260	-15.	9 4 5	10 5 6	4.50E-04	6.	4.56E-04	-1.3	1.92E-02	5.79E-04	1.59E-03
3276.78890	37.	9 0 9	9 3 6	6.60E-06	10.	7.04E-06	-6.7	3.96E-03	-3.62E-04	-9.47E-04
3278.62090	-17.	6 0 6	7 3 5	7.40E-04	3.	7.35E-04	-.7	-2.47E-02	5.74E-04	-2.99E-03
3279.09667	-1.	8 4 5	9 5 4	2.81E-03	3.	2.85E-03	-1.4	4.35E-02	-8.31E-04	1.07E-02
3282.83540	39.	13 3 10	14 4 11	7.28E-06	4.	7.62E-06	-4.6	2.67E-03	-7.43E-05	1.64E-04
*3283.06210	-10.	6 6 1	7 7 0	6.20E-03	2.	6.19E-03	.1	8.21E-02	-1.88E-03	-1.52E-03
3283.76375	-2.	8 3 6	9 4 5	2.40E-03	2.	2.43E-03	-1.2	4.14E-02	-1.03E-03	8.96E-03
3284.19440	-10.	7 5 3	8 6 2	1.03E-03	2.	1.04E-03	-1.4	3.38E-02	-8.10E-04	-6.38E-04
3284.22476	-6.	7 5 2	8 6 3	3.18E-03	3.	3.25E-03	-2.1	5.89E-02	-1.41E-03	-5.03E-04
*3285.67230	0.	16 1 16	17 0 17	6.90E-06	10.	7.51E-06	-8.9	-2.79E-03	5.89E-05	-5.57E-06
3286.85100	-78.	9 3 6	9 6 3	3.60E-06	15.	2.90E-06	19.4	2.95E-03	-1.15E-04	-1.13E-03
3288.09910	62.	14 3 12	15 2 13	5.30E-06	10.	5.33E-06	-.5	-2.37E-03	5.54E-05	2.75E-06
3294.05764	-11.	8 4 4	9 5 5	5.62E-04	3.	5.55E-04	1.2	2.40E-02	-2.16E-04	-1.76E-04
3299.86560	-17.	12 3 9	13 4 10	1.00E-05	10.	1.05E-05	-4.9	3.04E-03	-8.34E-05	2.77E-04
3303.07365	-7.	7 2 6	8 3 5	1.30E-03	5.	1.29E-03	1.1	3.08E-02	-7.22E-04	5.77E-03
3304.63990	-48.	7 1 7	7 4 4	8.40E-06	10.	8.68E-06	-3.4	4.18E-03	-1.60E-04	-1.08E-03
3308.07815	3.	7 4 4	8 5 3	2.60E-03	3.	2.63E-03	-1.1	4.17E-02	-8.90E-04	1.04E-02
3308.40508	-46.	3 1 3	4 4 0	3.00E-05	4.	3.12E-05	-3.9	-6.20E-03	1.48E-04	4.67E-04
3309.36834	-19.	14 2 13	15 1 14	1.90E-05	5.	2.10E-05	-10.4	-4.67E-03	1.05E-04	-1.55E-05
*3310.52600	34.	6 5 2	7 6 1	1.03E-02	2.	1.08E-02	-5.2	1.09E-01	-2.63E-03	-1.89E-03
3310.79230	5.	6 2 5	6 5 2	1.68E-05	3.	1.80E-05	-7.0	6.38E-03	-2.08E-04	-1.93E-03
3310.85540	5.	13 2 11	14 3 12	2.15E-05	7.	2.23E-05	-3.8	4.82E-03	-1.28E-04	3.52E-05
3311.58450	10.	13 3 11	14 2 12	7.30E-06	10.	7.27E-06	.4	-2.76E-03	6.05E-05	-2.93E-07
3313.39347	11.	6 1 6	7 2 5	3.53E-03	3.	3.47E-03	1.8	5.22E-02	-1.17E-03	7.89E-03
3314.10505	4.	11 3 8	12 4 9	1.16E-04	4.	1.17E-04	-.7	9.89E-03	-2.67E-04	1.18E-03
3317.27950	-4.	7 4 3	8 5 4	3.63E-03	4.	3.66E-03	-.9	6.79E-02	-1.21E-03	-6.18E-03
3317.68822	-11.	4 1 3	5 4 2	2.58E-04	2.	2.68E-04	-3.7	-1.69E-02	3.94E-04	1.01E-04
3317.80900	9.	11 2 9	11 5 6	4.50E-06	6.	4.28E-06	5.0	2.84E-03	-1.24E-04	-6.46E-04
3326.00960	-4.	10 3 7	11 4 8	1.30E-04	5.	1.29E-04	.5	1.02E-02	-2.72E-04	1.40E-03
3326.04304	-9.	7 3 5	8 4 4	2.63E-03	2.	2.65E-03	-.6	4.44E-02	-1.10E-03	8.15E-03
3327.32931	-7.	5 0 5	6 3 4	3.90E-03	2.	3.94E-03	-1.0	-5.86E-02	1.35E-03	-5.55E-03
3327.71060	2.	8 0 8	7 5 3	6.60E-06	10.	7.32E-06	-10.9	4.52E-04	1.91E-03	3.44E-04
3332.52024	0.	13 2 12	14 1 13	2.48E-05	3.	2.65E-05	-6.8	-5.23E-03	1.14E-04	-2.61E-05
*3332.57730	-101.	14 1 14	15 0 15	1.21E-04	3.	1.21E-04	.1	-1.12E-02	2.44E-04	-1.17E-05
3332.60450	-34.	12 3 10	13 2 11	5.42E-05	3.	5.16E-05	4.7	-7.01E-03	1.41E-05	-1.93E-04
3333.04510	14.	12 2 10	13 3 11	2.60E-05	10.	2.80E-05	-7.8	5.36E-03	-1.40E-04	7.65E-05
3334.56140	0.	13 1 12	14 2 13	5.10E-05	8.	5.70E-05	-11.7	7.96E-03	-2.74E-04	-1.33E-04
3334.62890	1.	6 4 3	7 5 2	1.69E-02	3.	1.78E-02	-5.2	1.05E-01	-2.45E-03	3.04E-02
*3336.84610	5.	5 5 0	6 6 1	2.32E-02	4.	2.40E-02	-3.3	1.63E-01	-3.97E-03	-4.29E-03
3336.88966	-15.	9 3 6	10 4 7	1.18E-03	2.	1.16E-03	1.7	3.07E-02	-8.02E-04	4.15E-03
3337.19955	-2.	8 0 8	8 3 5	1.43E-04	2.	1.44E-04	-.5	5.34E-03	7.22E-03	-5.66E-04
*3338.93100	0.	15 0 15	15 1 14	2.70E-06	5.	2.64E-06	2.3	-1.71E-03	5.93E-05	2.57E-05
3339.07840	0.	6 1 6	6 4 3	4.88E-05	3.	4.77E-05	2.3	9.58E-03	-3.16E-04	-2.36E-03

Table 9 continued

observed frequency	upper o-c	J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(100)	Z(020)	Z(001)
3339.28470	-25.	3	1	2	4	4	1	2.33E-04	3.	2.41E-04	-3.3	-1.69E-02	4.01E-04	9.34E-04
3342.29522	-11.	6	4	2	7	5	3	2.46E-03	2.	2.55E-03	-3.8	6.01E-02	-1.32E-03	-8.23E-03
3344.38200	-90.	10	2	8	10	5	5	5.80E-06	10.	5.17E-06	10.8	3.09E-03	-1.16E-04	-6.99E-04
3348.44360	-6.	8	3	5	9	4	6	1.05E-03	2.	1.04E-03	.8	2.98E-02	-7.66E-04	3.27E-03
3353.84370	4.	5	2	3	5	5	0	1.06E-05	3.	1.20E-05	-12.7	5.52E-03	-1.55E-04	-1.91E-03
3354.29733	2.	11	2	9	12	3	10	2.94E-04	3.	2.85E-04	3.0	1.69E-02	-4.43E-04	4.22E-04
*3355.60500	230.	13	0	13	14	1	14	3.95E-04	4.	4.21E-04	-6.7	2.10E-02	-4.58E-04	3.21E-05
3355.73200	40.	9	1	8	9	4	5	5.05E-05	10.	4.85E-05	4.0	9.20E-03	-4.45E-04	-1.79E-03
3355.87640	-15.	12	1	11	13	2	12	9.10E-05	6.	9.03E-05	.8	9.73E-03	-2.44E-04	1.26E-05
3357.01950	-67.	12	2	11	13	1	12	2.20E-04	10.	2.30E-04	-4.6	-1.58E-02	4.97E-04	1.78E-04
3357.03420	-20.	6	2	5	7	3	4	1.25E-02	4.	1.24E-02	.9	9.79E-02	-2.34E-03	1.57E-02
3359.18550	0.	11	4	8	12	3	9	1.53E-05	4.	1.50E-05	1.7	-5.22E-03	1.31E-04	1.22E-03
3360.40236	9.	9	2	7	9	5	4	3.69E-05	3.	3.70E-05	-.4	8.33E-03	-2.85E-04	-1.96E-03
3360.68170	0.	11	3	9	12	2	10	8.28E-05	3.	8.15E-05	1.6	-9.57E-03	2.79E-04	2.66E-04
3361.67262	-18.	6	3	4	7	4	3	2.09E-02	3.	2.11E-02	-.8	1.29E-01	-3.19E-03	1.91E-02
3362.28353	-5.	7	3	4	8	4	5	7.11E-03	3.	7.34E-03	-3.2	8.35E-02	-2.13E-03	4.25E-03
3362.96570	0.	14	1	14	14	2	13	7.20E-06	4.	8.23E-06	-14.2	-3.00E-03	8.98E-05	4.55E-05
3362.99450	0.	14	0	14	14	1	13	2.82E-06	10.	2.73E-06	3.3	-1.74E-03	6.24E-05	2.71E-05
3366.23140	51.	7	2	5	7	5	2	5.50E-05	6.	5.68E-05	-3.3	1.09E-02	-3.29E-04	-3.00E-03
3366.99478	17.	8	2	6	8	5	3	1.92E-05	5.	1.90E-05	1.1	6.09E-03	-1.95E-04	-1.54E-03
3367.34220	17.	5	1	5	5	4	2	1.79E-05	5.	1.90E-05	-6.2	5.97E-03	-1.77E-04	-1.43E-03
3367.64255	0.	5	4	1	6	5	2	1.68E-02	2.	1.73E-02	-2.9	1.56E-01	-3.91E-03	-2.02E-02
3369.15400	-10.	5	4	2	6	5	1	2.83E-03	3.	2.90E-03	-2.5	7.47E-02	-1.89E-03	-1.89E-02
3371.04885	-10.	4	0	4	5	3	3	1.71E-03	3.	1.72E-03	-.6	-3.99E-02	9.37E-04	-2.54E-03
3374.01962	-4.	10	2	8	11	3	9	3.00E-04	2.	2.93E-04	2.5	1.69E-02	-4.40E-04	6.94E-04
3374.68305	9.	5	1	5	6	2	4	3.07E-03	2.	3.06E-03	.2	4.99E-02	-1.16E-03	6.61E-03
3378.06426	8.	12	1	12	13	0	13	9.80E-04	4.	9.66E-04	1.4	-3.15E-02	6.29E-04	-1.70E-04
3378.43735	-2.	11	1	10	12	2	11	8.70E-04	4.	8.48E-04	2.6	2.98E-02	-7.42E-04	9.25E-05
3378.91820	-1.	11	2	10	12	1	11	2.83E-04	3.	2.78E-04	1.7	-1.71E-02	4.42E-04	2.30E-05
3379.66578	9.	12	0	12	13	1	13	2.20E-04	2.	2.23E-04	-1.4	1.56E-02	-4.79E-04	-2.09E-04
3380.46727	-13.	6	3	3	7	4	4	3.42E-03	2.	3.37E-03	1.6	6.92E-02	-1.76E-03	-9.43E-03
3385.60160	-5.	10	3	8	11	2	9	7.10E-04	3.	7.00E-04	1.4	-2.85E-02	7.89E-04	1.28E-03
3386.75400	0.	13	1	13	13	2	12	1.03E-05	6.	1.02E-05	.5	-3.38E-03	1.21E-04	5.47E-05
3386.80781	0.	13	0	13	13	1	12	3.00E-05	4.	3.08E-05	-2.5	-5.86E-03	2.17E-04	9.43E-05
3389.15440	58.	14	2	13	14	3	12	4.60E-06	7.	4.59E-06	.1	-2.29E-03	8.57E-05	6.20E-05
3389.46730	-17.	4	1	4	4	4	1	3.35E-05	3.	3.43E-05	-2.3	7.95E-03	-2.14E-04	-1.88E-03
3389.66000	0.	14	1	13	14	2	12	1.60E-06	10.	1.51E-06	5.8	-1.32E-03	5.67E-05	3.49E-05
3389.82792	3.	7	0	7	7	3	4	1.87E-04	2.	1.87E-04	.0	1.67E-02	-1.84E-04	-2.85E-03
3391.57133	-6.	9	2	7	10	3	8	2.42E-03	2.	2.43E-03	-.2	4.75E-02	-1.24E-03	2.96E-03
3391.81330	-5.	8	1	7	8	4	4	6.20E-05	3.	5.74E-05	7.5	9.80E-03	-4.52E-04	-1.78E-03
3392.50712	-6.	5	3	3	6	4	2	1.50E-02	2.	1.53E-02	-.8	1.14E-01	-2.86E-03	1.24E-02
3392.72536	-8.	4	4	0	5	5	1	1.33E-02	4.	1.36E-02	-.9	1.32E-01	-3.36E-03	-1.17E-02
3392.94133	-1.	4	4	1	5	5	0	3.65E-02	3.	3.70E-02	-1.3	2.21E-01	-5.65E-03	-2.34E-02
3394.57860	-6.	10	4	7	11	3	8	7.63E-05	3.	7.04E-05	7.7	-1.51E-02	3.91E-04	6.28E-03
3395.87830	-21.	11	5	7	12	4	8	1.60E-05	3.	1.76E-05	-10.1	-2.51E-03	7.27E-05	6.63E-03
3397.21331	3.	5	3	2	6	4	3	5.13E-02	3.	5.13E-02	-.1	1.85E-01	-4.67E-03	4.60E-02
3400.65088	-3.	10	1	9	11	2	10	8.38E-04	2.	7.97E-04	4.9	2.88E-02	-7.25E-04	1.51E-04
3401.05340	-5.	11	0	11	12	1	12	2.80E-03	5.	2.86E-03	-2.1	5.48E-02	-1.31E-03	-1.71E-06
3401.09236	7.	11	1	11	12	0	12	9.69E-04	3.	9.49E-04	2.0	-3.16E-02	7.63E-04	1.52E-05
3401.49902	8.	10	2	9	11	1	10	2.40E-03	4.	2.35E-03	2.2	-4.98E-02	1.28E-03	8.37E-05
3403.58283	-13.	5	2	4	6	3	3	1.07E-02	3.	1.14E-02	-6.1	9.67E-02	-2.39E-03	1.22E-02
3406.67494	5.	8	2	6	9	3	7	2.02E-03	2.	2.00E-03	1.2	4.23E-02	-1.11E-03	3.48E-03
3408.85528	9.	3	0	3	4	3	2	4.13E-03	2.	4.14E-03	-.2	-6.41E-02	1.56E-03	-1.76E-03
3409.98320	7.	12	1	12	12	2	11	9.25E-05	3.	8.82E-05	4.6	-1.06E-02	9.83E-04	2.07E-04
3411.72090	-9.	12	0	12	12	1	11	3.57E-05	3.	3.94E-05	-10.3	-5.46E-03	-8.58E-04	4.18E-05
3412.34100	150.	13	2	12	13	3	11	6.90E-06	10.	6.08E-06	11.8	-2.64E-03	1.37E-04	7.91E-05
3412.47282	7.	9	3	7	10	2	8	5.75E-04	2.	5.50E-04	4.3	-2.63E-02	7.22E-04	2.12E-03
3415.58970	-98.	13	1	12	13	2	11	2.30E-05	7.	2.08E-05	9.5	-4.20E-03	-4.32E-04	6.53E-05
3417.17750	-6.	7	1	6	7	4	3	3.95E-04	2.	3.94E-04	.3	2.57E-02	-1.26E-03	-4.59E-03
3419.95040	0.	7	2	5	8	3	6	1.30E-02	6.	1.32E-02	-1.4	1.08E-01	-2.82E-03	9.94E-03
3420.49755	-21.	4	3	2	5	4	1	8.41E-02	4.	8.35E-02	.7	2.77E-01	-7.13E-03	1.86E-02
3421.73900	-16.	4	3	1	5	4	2	2.84E-02	3.	2.91E-02	-2.3	1.58E-01	-4.07E-03	1.61E-02
3422.33290	1.	9	1	8	10	2	9	5.88E-03	3.	6.07E-03	-3.3	7.92E-02	-2.02E-03	6.99E-04
3423.24453	2.	10	0	10	11	1	11	2.50E-03	4.	2.48E-03	.9	5.10E-02	-1.24E-03	2.33E-05
3423.27779	6.	10	1	10	11	0	11	7.50E-03	5.	7.44E-03	.9	-8.84E-02	2.15E-03	-1.10E-05
3424.08631	4.	9	2	8	10	1	9	2.00E-03	2.	1.96E-03	2.2	-4.56E-02	1.18E-03	1.92E-04
*3424.22660	6.	8	7	2	8	8	1	3.50E-05	3.	3.29E-05	5.9	-1.00E-02	2.12E-04	4.10E-03
3431.06450	1.	4	1	4	5	2	3	2.30E-02	5.	2.34E-02	-1.7	1.41E-01	-3.48E-03	1.50E-02
3432.48200	7.	6	1	5	6	4	2	1.79E-04	3.	1.74E-04	2.8	1.75E-02	-1.08E-03	-3.26E-03
3432.83008	-11.	6	2	4	7	3	5	8.55E-03	2.	8.75E-03	-2.4	8.85E-02	-2.31E-03	7.39E-03
3433.76600	-40.	6	0	6	6	3	3	2.14E-04	2.	2.07E-04	3.3	1.73E-02	-3.89E-04	-2.57E-03
3433.80080	9.	11	1	11	11	2	10	1.25E-04	7.	1.21E-04	3.1	-1.13E-02	1.23E-04	1.86E-04
3434.05321	-8.	11	0	11	11	1	10	3.42E-04	3.	3.59E-04	-5.1	-1.96E-02	3.16E-04	3.21E-04
3435.98025	12.	10	5	6	11	4	7	1.21E-03	2.	1.25E-03	-3.4	-6.42E-03	1.91E-04	4.16E-02

Table 9 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)%	Z(100)	Z(020)	Z(001)
3436.82430	45.	12 2 11	12 3 10	8.65E-05	4.	8.23E-05	4.9	-8.73E-03	-5.26E-04	1.84E-04
3439.19470	-25.	5 1 4	5 4 1	3.04E-04	3.	3.19E-04	-4.8	2.63E-02	-3.08E-03	-5.38E-03
3439.66840	-19.	4 1 3	4 4 0	4.60E-05	10.	5.01E-05	-8.9	9.25E-03	-2.50E-04	-1.92E-03
3440.72258	-5.	2 0 2	3 3 1	4.78E-04	3.	4.83E-04	-1.1	-2.28E-02	5.76E-04	2.84E-04
3442.07760	0.	8 3 6	9 2 7	3.16E-03	2.	3.08E-03	2.4	-6.70E-02	1.86E-03	9.62E-03
3442.50290	-10.	4 2 3	5 3 2	7.67E-02	3.	7.59E-02	1.1	2.59E-01	-6.65E-03	2.27E-02
3443.20353	5.	8 1 7	9 2 8	4.44E-03	2.	4.62E-03	-4.0	6.87E-02	-1.78E-03	1.04E-03
3445.15775	-1.	9 0 9	10 1 10	1.77E-02	3.	1.75E-02	1.0	1.36E-01	-3.36E-03	1.07E-04
3445.21970	-22.	9 1 9	10 0 10	5.70E-03	5.	5.82E-03	-2.1	-7.82E-02	1.95E-03	-1.85E-05
3445.79820	4.	9 6 4	9 7 3	1.81E-05	5.	1.61E-05	11.2	-7.18E-03	2.02E-04	2.97E-03
3445.85900	-179.	9 6 3	9 7 2	6.13E-05	2.	4.90E-05	20.1	-1.24E-02	3.51E-04	5.10E-03
3446.88450	0.	8 2 7	9 1 8	1.30E-02	8.	1.30E-02	-1.	-1.18E-01	3.11E-03	1.16E-03
3446.94124	-1.	5 2 3	6 3 4	4.51E-02	3.	4.52E-02	-2.	2.10E-01	-5.51E-03	7.66E-03
3447.07690	-19.	3 3 1	4 4 0	4.32E-02	3.	4.38E-02	-1.3	2.11E-01	-5.58E-03	3.82E-03
3447.23680	-21.	3 3 0	4 4 1	1.30E-01	5.	1.33E-01	-2.0	3.65E-01	-9.63E-03	9.10E-03
3448.93660	-74.	8 6 3	8 7 2	1.28E-04	6.	1.14E-04	10.6	-1.82E-02	4.95E-04	6.97E-03
3448.95110	-33.	8 6 2	8 7 1	4.25E-05	6.	3.83E-05	9.9	-1.05E-02	2.86E-04	4.01E-03
*3451.96120	-55.	7 6 1	7 7 0	2.40E-04	2.	2.38E-04	.7	-2.51E-02	6.62E-04	8.98E-03
3456.75377	12.	10 1 10	10 2 9	1.04E-03	3.	1.03E-03	1.3	-3.33E-02	6.82E-04	5.92E-04
3457.34400	3.	10 0 10	10 1 9	3.55E-04	3.	3.43E-04	3.4	-1.93E-02	4.37E-04	3.30E-04
3458.46570	-15.	11 2 10	11 3 9	8.80E-05	3.	8.87E-05	-.8	-9.84E-03	1.33E-04	2.88E-04
3460.01510	-19.	10 5 6	10 6 5	1.60E-04	4.	1.56E-04	2.3	-1.02E-02	3.38E-04	-2.59E-03
3460.71710	-33.	11 6 6	12 5 7	4.02E-05	10.	4.14E-05	-3.0	-1.29E-03	4.10E-05	-5.19E-03
3462.52430	22.	11 1 10	11 2 9	2.71E-04	3.	2.64E-04	2.8	-1.71E-02	4.09E-04	4.46E-04
3462.59086	-36.	4 2 2	5 3 3	3.27E-02	3.	3.27E-02	.1	1.62E-01	-4.27E-03	2.35E-02
3462.81448	3.	7 1 6	8 2 7	2.81E-02	2.	2.83E-02	-.9	1.69E-01	-4.44E-03	4.27E-03
3464.74340	38.	12 6 6	13 5 9	7.60E-06	10.	7.73E-06	-1.7	-6.20E-04	1.92E-05	-2.18E-03
3465.01510	-104.	12 7 6	13 6 7	7.89E-06	10.	8.47E-06	-.7.3	-6.83E-04	2.08E-05	-2.25E-03
3466.89443	-8.	8 1 8	9 0 9	3.90E-02	4.	3.70E-02	5.3	-1.97E-01	5.03E-03	-2.62E-05
3467.14700	-25.	8 0 8	9 1 9	7.33E-03	3.	7.72E-03	-5.3	9.07E-02	-2.43E-03	-4.11E-04
3467.49559	-43.	5 0 5	5 3 2	1.45E-03	2.	1.45E-03	.2	4.53E-02	-1.17E-03	-6.07E-03
3470.34110	4.	7 2 6	8 1 7	8.24E-03	3.	8.31E-03	-.9	-9.57E-02	2.57E-03	1.97E-03
3473.47486	-8.	8 4 5	9 3 6	2.17E-04	3.	2.32E-04	-7.0	-3.27E-02	9.39E-04	4.70E-02
3474.90700	2.	7 3 5	8 2 6	1.42E-03	4.	1.40E-03	1.6	-5.18E-02	1.47E-03	1.29E-02
3475.03302	-5.	3 2 2	4 3 1	4.47E-02	3.	4.48E-02	-.1	2.07E-01	-5.53E-03	9.72E-03
3475.94640	-39.	10 5 5	10 6 4	1.59E-05	10.	1.41E-05	11.1	-6.90E-03	2.43E-04	2.90E-03
3476.34590	-21.	9 5 4	9 6 3	1.23E-04	2.	1.19E-04	2.9	-2.00E-02	6.69E-04	8.38E-03
3477.10100	-286.	9 5 5	9 6 4	1.33E-05	10.	1.08E-05	18.9	-1.01E-02	3.42E-04	6.47E-03
3477.76190	-27.	8 5 3	8 6 2	1.07E-04	2.	1.03E-04	4.0	-1.77E-02	5.66E-04	7.02E-03
3477.84510	-54.	8 5 4	8 6 3	2.60E-04	5.	2.36E-04	9.2	-2.98E-02	9.51E-04	1.35E-02
3477.85860	-78.	11 3 9	11 4 8	6.70E-05	10.	5.44E-05	18.9	-7.78E-03	1.50E-05	3.96E-04
*3479.64290	115.	7 5 2	7 6 1	8.90E-04	3.	8.80E-04	1.1	-4.88E-02	1.49E-03	1.76E-02
3480.21855	-6.	10 2 9	10 3 8	8.26E-04	3.	8.21E-04	.6	-3.03E-02	6.62E-04	9.78E-04
3480.62810	5.	9 0 9	9 1 8	2.68E-03	3.	2.71E-03	-1.0	-5.44E-02	1.42E-03	9.48E-04
3480.65380	-10.	6 1 5	7 2 6	1.71E-02	4.	1.71E-02	.0	1.29E-01	-3.46E-03	4.98E-03
3480.76020	3.	3 1 3	4 2 2	1.77E-02	2.	1.82E-02	-.7.	1.29E-01	-3.38E-03	9.36E-03
*3481.66200	-22.	6 5 2	6 6 1	1.28E-03	2.	1.26E-03	1.7	-5.51E-02	1.61E-03	1.81E-02
3482.24690	5.	3 2 1	4 3 2	1.40E-01	3.	1.42E-01	-1.6	3.67E-01	-9.92E-03	1.96E-02
3486.68740	1.	11 6 5	12 5 8	9.22E-05	2.	8.98E-05	2.6	-2.15E-03	6.86E-05	-7.39E-03
3487.81830	0.	10 1 9	10 2 8	2.70E-04	2.	2.79E-04	-.3.4	-1.76E-02	4.77E-04	4.46E-04
3488.02182	0.	7 0 7	8 1 8	6.95E-02	2.	7.04E-02	-1.3	2.72E-01	-7.13E-03	4.62E-04
3488.32053	-8.	7 1 7	8 0 8	2.30E-02	2.	2.33E-02	-1.4	-1.57E-01	4.11E-03	4.42E-05
3489.08320	-5.	10 4 7	10 5 6	2.52E-04	2.	2.47E-04	1.8	-1.82E-02	9.22E-04	1.60E-03
3491.17450	-3.	4 0 4	4 3 1	6.35E-04	2.	6.35E-04	.0	2.99E-02	-8.17E-04	-3.85E-03
3494.92992	-14.	10 3 8	10 4 7	5.26E-04	3.	5.21E-04	1.0	-2.47E-02	4.48E-04	1.45E-03
3495.17695	1.	6 2 5	7 1 6	3.97E-02	2.	4.03E-02	-.1.5	-2.15E-01	5.95E-03	8.50E-03
3496.27977	-18.	9 4 6	9 5 5	2.45E-04	4.	2.40E-04	2.2	-1.79E-02	8.91E-04	1.49E-03
3496.38290	-6.	11 5 6	12 4 9	1.57E-04	2.	1.49E-04	4.9	-2.71E-03	8.57E-05	-9.59E-03
3496.62467	-5.	5 1 4	6 2 5	8.00E-02	4.	8.18E-02	-2.3	2.80E-01	-7.60E-03	1.40E-02
3496.91720	-21.	11 7 5	12 6 6	9.76E-06	10.	9.07E-06	7.0	-7.38E-04	2.31E-05	-2.30E-03
3497.98505	-19.	10 6 5	11 5 6	3.22E-04	2.	3.14E-04	2.4	-3.96E-03	1.30E-04	-1.39E-02
3500.67722	6.	11 7 4	12 6 7	2.75E-05	3.	2.69E-05	2.3	-1.27E-03	3.96E-05	-3.95E-03
3500.87307	-11.	9 2 8	9 3 7	7.61E-04	2.	7.74E-04	-.7.	-2.96E-02	7.56E-04	1.06E-03
3501.22725	-4.	8 4 5	8 5 4	1.85E-03	2.	1.83E-03	1.2	-4.84E-02	2.29E-03	3.33E-03
3501.46267	3.	8 1 8	8 2 7	6.80E-03	2.	6.50E-03	4.4	-8.45E-02	2.20E-03	1.69E-03
3503.27570	-8.	2 2 1	3 3 0	1.92E-01	4.	1.95E-01	-1.6	4.52E-01	-1.26E-02	2.58E-03
3503.58072	-10.	11 2 9	11 3 8	1.71E-04	2.	1.78E-04	-4.1	-1.42E-02	3.90E-04	5.16E-04
3504.34299	-2.	7 4 4	7 5 3	1.33E-03	4.	1.32E-03	.7	-3.92E-02	1.69E-03	1.22E-03
3504.46687	-4.	8 0 8	8 1 7	1.68E-03	3.	1.73E-03	-2.8	-3.99E-02	-2.03E-03	3.44E-04
3504.75010	4.	2 2 0	3 3 1	6.30E-02	5.	6.55E-02	-4.0	2.62E-01	-7.29E-03	1.77E-03
3505.86556	-3.	6 4 3	6 5 2	6.30E-03	5.	6.60E-03	-4.8	-8.01E-02	2.95E-03	-4.12E-03
3505.95350	0.	3 0 3	3 3 0	1.03E-03	5.	1.03E-03	-.5	3.82E-02	-1.08E-03	-4.96E-03
3508.37903	3.	10 5 5	11 4 8	2.34E-04	2.	2.32E-04	1.1	-3.19E-03	1.02E-04	-1.21E-02
3508.83606	-6.	6 0 6	7 1 7	3.90E-02	4.	3.98E-02	-2.1	2.04E-01	-5.52E-03	6.29E-04

Table 9 continued

observed frequency	o-c	upper J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)%	Z(100)	Z(020)	Z(001)
3509.55958	-6.	6	1	6	7	0	7	1.31E-01	2.	1.18E-01	9.9	-3.54E-01	9.56E-03	4.60E-04
3510.50011	3.	6	3	4	7	2	5	3.72E-03	3.	3.65E-03	2.0	-1.09E-01	3.21E-03	4.55E-02
3511.43040	-2.	10	6	4	11	5	7	9.30E-05	2.	9.22E-05	.8	-2.25E-03	7.36E-05	-7.43E-03
3511.59395	-7.	4	1	3	5	2	4	3.96E-02	2.	3.91E-02	1.2	1.93E-01	-5.36E-03	1.02E-02
3512.61083	-2.	7	4	3	7	5	2	9.91E-04	2.	9.48E-04	4.3	-6.31E-02	3.92E-03	2.84E-02
3513.12690	-9.	8	4	4	8	5	3	1.95E-04	2.	1.86E-04	4.8	-2.57E-02	2.17E-03	9.95E-03
3513.83202	3.	7	4	4	8	3	5	2.29E-03	2.	2.27E-03	.7	-2.46E-02	7.46E-04	7.15E-02
3514.04553	10.	9	1	8	9	2	7	2.55E-03	5.	2.46E-03	3.6	-5.23E-02	1.53E-03	1.23E-03
3514.16499	-2.	5	4	1	5	5	0	2.28E-03	3.	2.26E-03	.8	-8.42E-02	2.59E-03	3.41E-02
3519.84813	-2.	8	2	7	8	3	6	5.72E-03	3.	5.89E-03	-3.1	-8.24E-02	2.29E-03	3.33E-03
3521.29060	3.	8	3	6	8	4	5	3.78E-03	2.	3.75E-03	.7	-6.83E-02	1.85E-03	5.15E-03
3522.09520	36.	10	4	6	10	5	5	6.45E-05	3.	6.44E-05	.2	-1.01E-02	-2.90E-04	2.37E-03
3522.22609	0.	5	2	4	6	1	5	1.73E-02	3.	1.74E-02	-.6	-1.46E-01	4.18E-03	1.02E-02
3522.74030	-9.	2	1	2	3	2	1	1.00E-01	3.	1.08E-01	-7.9	3.26E-01	-9.09E-03	1.20E-02
3522.77610	4.	7	1	7	7	2	6	4.55E-03	2.	4.72E-03	-3.7	-7.22E-02	2.00E-03	1.57E-03
3526.39309	-6.	9	5	4	10	4	7	2.38E-03	3.	2.38E-03	-.1	-9.89E-03	3.24E-04	-3.92E-02
3526.56902	3.	10	7	4	11	6	5	7.55E-05	2.	7.38E-05	2.3	-2.17E-03	7.01E-05	-6.49E-03
3527.03033	-3.	3	1	2	4	2	3	1.44E-01	3.	1.52E-01	-5.4	3.83E-01	-1.09E-02	1.70E-02
3527.97044	0.	7	0	7	7	1	6	1.36E-02	2.	1.46E-02	-7.1	-1.26E-01	3.45E-03	1.96E-03
3529.05576	4.	5	0	5	6	1	6	1.70E-01	5.	1.81E-01	-6.3	4.35E-01	-1.21E-02	2.44E-03
3529.22175	1.	8	5	4	9	4	5	8.48E-03	2.	8.98E-03	-5.9	-1.59E-02	5.26E-04	-7.94E-02
3530.07475	-5.	7	3	5	7	4	4	2.74E-03	3.	2.69E-03	1.8	-5.86E-02	1.70E-03	4.99E-03
3530.75983	-3.	5	1	5	6	0	6	5.50E-02	8.	5.84E-02	-6.3	-2.50E-01	6.97E-03	8.65E-04
3530.93820	-63.	10	2	8	10	3	7	2.40E-04	6.	2.16E-04	9.9	-1.58E-02	4.71E-04	6.00E-04
3531.67595	-8.	9	6	4	10	5	5	2.47E-04	3.	2.38E-04	3.7	-3.67E-03	1.24E-04	-1.19E-02
3536.18511	-1.	6	3	4	6	4	3	1.63E-02	3.	1.45E-02	10.9	-1.38E-01	4.15E-03	1.32E-02
3540.04810	-17.	11	3	8	11	4	7	1.29E-04	2.	1.31E-04	-1.6	-1.29E-02	3.87E-04	1.05E-03
3540.17271	-23.	5	3	3	5	4	2	7.10E-03	2.	6.86E-03	3.4	-9.61E-02	2.97E-03	1.03E-02
3540.67725	5.	8	1	7	8	2	6	2.26E-03	2.	2.25E-03	.7	-5.00E-02	1.55E-03	1.07E-03
3542.73120	-3.	4	3	2	4	4	1	2.02E-02	3.	1.97E-02	2.4	-1.66E-01	5.20E-03	1.99E-02
3542.89188	9.	6	1	6	6	2	5	2.76E-02	3.	2.78E-02	-.6	-1.76E-01	5.14E-03	4.28E-03
3543.59693	3.	5	3	2	5	4	1	2.55E-02	3.	2.50E-02	1.9	-1.55E-01	4.83E-03	-8.04E-03
3543.71940	-2.	4	3	1	4	4	0	7.10E-03	3.	7.00E-03	1.4	-9.42E-02	2.96E-03	7.61E-03
3544.16297	5.	2	1	1	3	2	2	5.93E-02	3.	5.99E-02	-.9	2.46E-01	-7.15E-03	6.25E-03
3545.99337	6.	9	4	5	10	3	8	1.42E-03	2.	1.34E-03	5.9	-7.87E-03	1.34E-04	-2.88E-02
3547.51392	5.	5	3	3	6	2	4	4.26E-04	3.	4.14E-04	2.7	-6.88E-02	2.12E-03	4.64E-02
3548.39164	6.	4	0	4	5	1	5	7.27E-02	10.	7.95E-02	-9.3	2.87E-01	-8.26E-03	2.79E-03
3548.51915	-3.	8	5	3	9	4	6	1.97E-03	2.	1.98E-03	-.6	-9.04E-03	3.03E-04	-3.58E-02
3550.41228	-1.	6	2	5	6	3	4	2.72E-02	2.	2.59E-02	4.7	-1.76E-01	5.39E-03	9.66E-03
3550.43108	-3.	6	3	3	6	4	2	1.70E-03	6.	1.65E-03	2.8	-7.19E-02	2.26E-03	2.90E-02
3551.73146	-14.	10	4	6	11	3	9	1.11E-04	3.	1.14E-04	-2.9	-2.62E-03	1.04E-04	-8.17E-03
3551.85754	0.	4	2	3	5	1	4	4.95E-02	3.	5.18E-02	-4.6	-2.65E-01	7.93E-03	2.96E-02
3552.10773	-1.	6	4	3	7	3	4	7.47E-02	2.	7.21E-02	3.4	-4.81E-02	1.55E-03	3.15E-01
3552.22731	5.	4	1	4	5	0	5	2.21E-01	4.	2.25E-01	-1.7	-4.92E-01	1.42E-02	3.69E-03
3552.40954	1.	6	0	6	6	1	5	1.00E-02	5.	9.90E-03	1.0	-1.04E-01	3.07E-03	1.37E-03
3552.58660	34.	10	3	7	10	4	6	1.56E-04	3.	1.58E-04	-.1	-1.44E-02	4.55E-04	1.41E-03
3552.80722	-5.	8	4	4	9	3	7	3.95E-03	2.	3.87E-03	2.0	-1.08E-02	3.07E-04	-5.18E-02
3553.75530	29.	7	3	4	7	4	3	5.75E-03	4.	5.98E-03	-4.0	-1.02E-01	3.21E-03	2.14E-02
3554.71910	16.	9	7	3	10	6	4	5.22E-05	2.	5.37E-05	-2.9	-1.91E-03	6.36E-05	-5.49E-03
3554.78054	1.	9	2	7	9	3	6	2.23E-03	3.	2.19E-03	1.7	-5.06E-02	1.61E-03	2.18E-03
3557.12963	6.	1	1	1	2	2	0	5.51E-02	2.	5.58E-02	-.3	2.43E-01	-7.25E-03	6.25E-04
*3557.71370	88.	10	9	2	11	8	3	3.70E-06	10.	3.78E-06	-2.2	-4.71E-04	1.64E-05	-1.49E-03
3557.99948	3.	9	3	6	9	4	5	1.46E-03	2.	1.40E-03	4.4	-4.40E-02	1.41E-03	5.27E-03
3561.16374	-3.	5	2	4	5	3	3	1.41E-02	3.	1.41E-02	-.2	-1.32E-01	4.14E-03	8.54E-03
3561.24760	-12.	5	1	5	5	2	4	1.62E-02	2.	1.61E-02	.5	-1.35E-01	4.11E-03	3.81E-03
3561.42842	0.	5	1	4	4	4	1	1.24E-04	2.	1.14E-04	8.1	7.87E-03	6.14E-03	-3.33E-03
3562.06225	-7.	11	4	7	12	3	10	5.80E-05	3.	5.93E-05	-2.3	-1.98E-03	7.21E-05	-5.80E-03
3563.58962	9.	1	1	0	2	2	1	1.98E-01	4.	1.97E-01	.7	4.57E-01	-1.38E-02	0.00E+00
3564.06086	4.	7	5	3	8	4	4	4.19E-03	2.	4.18E-03	.3	-1.27E-02	4.36E-04	-5.23E-02
3566.00486	2.	7	1	6	7	2	5	1.77E-02	4.	1.73E-02	2.3	-1.39E-01	4.52E-03	2.89E-03
3566.33036	0.	7	4	3	8	3	6	5.11E-02	2.	4.95E-02	3.2	-2.97E-02	9.50E-04	-1.94E-01
3566.53360	-9.	3	0	3	4	1	4	2.67E-01	2.	2.72E-01	-2.1	5.30E-01	-1.58E-02	7.70E-03
3568.79811	-6.	4	2	3	4	3	2	5.51E-02	3.	5.50E-02	.2	-2.63E-01	8.41E-03	2.01E-02
3570.02200	360.	9	8	2	10	7	3	1.10E-05	4.	1.03E-05	6.4	-8.32E-04	2.73E-05	-2.40E-03
3570.04180	-3.	9	8	1	10	7	4	3.20E-05	3.	3.10E-05	3.2	-1.44E-03	4.73E-05	-4.17E-03
3572.74835	-13.	8	2	6	8	3	5	2.23E-03	3.	2.17E-03	2.7	-5.09E-02	1.69E-03	2.63E-03
3573.12771	-1.	7	5	2	8	4	5	1.07E-02	2.	1.09E-02	-1.6	-2.18E-02	7.54E-04	-8.32E-02
3573.65621	-3.	3	2	2	3	3	1	1.57E-02	2.	1.61E-02	-2.3	-1.44E-01	4.66E-03	1.28E-02
3574.48688	-6.	3	1	3	4	0	4	7.72E-02	5.	7.92E-02	-2.6	-2.94E-01	8.91E-03	4.07E-03
3576.85061	5.	5	0	5	5	1	4	5.92E-02	3.	5.62E-02	5.0	-2.47E-01	7.75E-03	2.54E-03
3577.21288	0.	4	1	4	4	2	3	7.13E-02	2.	7.34E-02	-3.0	-2.90E-01	9.14E-03	9.73E-03
3579.34450	-66.	3	2	1	3	3	0	5.50E-02	10.	5.05E-02	8.3	-2.53E-01	8.25E-03	1.99E-02
3581.88623	-15.	8	7	2	9	6	3	2.66E-04	3.	2.63E-04	1.3	-4.31E-03	1.50E-04	-1.20E-02
3582.02334	-4.	8	7	1	9	6	4	8.40E-05	3.	8.73E-05	-3.9	-2.49E-03	8.64E-05	-6.94E-03

Table 9 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(100)	Z(020)	Z(001)
3582.71676	-4.	4 2 2	4 3 1	2.20E-02	2.	2.22E-02	-.8	-1.56E-01	5.14E-03	1.49E-03
3583.37857	2.	3 2 2	4 1 3	1.25E-02	4.	1.25E-02	-.1	-1.38E-01	4.36E-03	2.20E-02
3583.66351	2.	2 0 2	3 1 3	8.90E-02	3.	8.91E-02	-.1	3.03E-01	-9.33E-03	4.99E-03
3583.70962	-12.	7 2 5	7 3 4	1.60E-02	3.	1.61E-02	-.4	-1.40E-01	4.73E-03	8.90E-03
3584.32900	75.	4 3 2	5 2 3	3.85E-05	4.	3.50E-05	9.1	-1.15E-01	3.77E-03	1.17E-01
3585.24793	18.	6 4 2	7 3 5	4.30E-02	3.	4.42E-02	-2.8	-2.29E-02	7.71E-04	-1.88E-01
3587.10780	-9.	5 2 3	5 3 2	4.33E-02	2.	4.33E-02	.0	-2.47E-01	8.27E-03	3.06E-02
3587.48869	7.	6 1 5	6 2 4	1.32E-02	4.	1.36E-02	-3.1	-1.24E-01	4.18E-03	2.83E-03
3587.97548	-4.	6 2 4	6 3 3	1.01E-02	3.	1.03E-02	-1.6	-1.14E-01	3.87E-03	9.31E-03
3589.79730	-40.	4 0 4	3 3 1	3.38E-05	3.	3.22E-05	4.7	9.00E-03	-3.51E-04	-2.97E-03
3590.23826	-2.	3 1 3	3 2 2	3.05E-02	2.	3.03E-02	.5	-1.88E-01	6.09E-03	7.58E-03
3590.86206	-2.	7 6 2	8 5 3	6.40E-04	4.	6.40E-04	.0	-6.53E-03	2.33E-04	-1.90E-02
3591.34730	9.	6 0 6	5 3 3	2.28E-05	6.	2.59E-05	-13.6	1.02E-02	-5.25E-04	-4.58E-03
3591.60916	-4.	7 6 1	8 5 4	1.98E-03	2.	1.91E-03	3.4	-1.13E-02	4.04E-04	-3.29E-02
3591.68990	2.	7 1 6	6 4 3	4.16E-05	3.	3.26E-05	21.7	1.15E-02	5.78E-04	-6.40E-03
3593.79124	5.	5 0 5	4 3 2	1.31E-04	3.	1.24E-04	5.4	1.96E-02	-8.52E-04	-7.64E-03
3595.48270	-36.	6 5 2	7 4 3	1.50E-02	10.	1.47E-02	2.2	-2.60E-02	9.27E-04	-9.60E-02
3596.23775	-9.	5 4 2	6 3 3	1.35E-01	3.	1.37E-01	-1.3	-2.28E-02	7.91E-04	-3.48E-01
3598.13526	16.	2 1 2	3 0 3	1.97E-01	3.	1.93E-01	2.1	-4.64E-01	1.47E-02	9.89E-03
3598.60312	4.	6 3 3	7 2 6	6.55E-02	2.	6.44E-02	1.6	-2.38E-02	8.05E-04	-2.31E-01
3598.97647	-12.	6 5 1	7 4 4	4.70E-03	5.	4.70E-03	.0	-1.50E-02	5.35E-04	-5.41E-02
3599.39190	0.	7 3 4	8 2 7	1.70E-02	6.	1.61E-02	5.6	-2.51E-02	8.57E-04	-1.02E-01
3599.52010	9.	4 0 4	4 1 3	3.35E-02	3.	3.38E-02	-1.0	-1.92E-01	6.31E-03	1.62E-03
3599.99530	19.	2 1 2	2 2 1	7.50E-02	10.	7.92E-02	-5.6	-3.06E-01	1.01E-02	1.46E-02
3600.95720	3.	1 0 1	2 1 2	2.23E-01	3.	2.25E-01	-1.1	4.85E-01	-1.55E-02	5.60E-03
3601.02670	2.	5 3 2	6 2 5	1.40E-01	6.	1.44E-01	-3.0	-6.86E-02	2.31E-03	4.46E-01
3603.02545	1.	5 1 4	5 2 3	8.30E-02	3.	8.26E-02	.5	-3.06E-01	1.06E-02	8.42E-03
3604.65300	-3.	8 1 8	7 2 5	1.95E-05	3.	1.64E-05	15.9	-1.04E-02	5.77E-04	5.81E-03
3607.26250	-10.	5 4 1	6 3 4	2.18E-01	3.	2.22E-01	-1.7	-4.59E-02	1.62E-03	-4.27E-01
3608.38421	0.	7 7 1	8 6 2	8.70E-05	3.	8.44E-05	3.0	-2.50E-03	9.08E-05	-6.77E-03
3608.41482	0.	7 7 0	8 6 3	2.61E-04	2.	2.54E-04	2.8	-4.34E-03	1.57E-04	-1.17E-02
3612.02330	8.	4 1 3	4 2 2	4.55E-02	2.	4.43E-02	2.6	-2.26E-01	7.80E-03	7.52E-03
3614.30042	-1.	2 1 1	2 2 0	3.62E-02	2.	3.69E-02	-2.1	-2.09E-01	7.18E-03	9.90E-03
3615.23625	-3.	3 1 2	3 2 1	1.63E-01	4.	1.53E-01	5.9	-4.23E-01	1.46E-02	1.69E-02
3615.32840	-15.	2 2 1	3 1 2	1.68E-02	3.	1.71E-02	-1.6	-1.70E-01	5.74E-03	3.39E-02
3615.64478	-7.	4 3 1	5 2 4	1.03E-02	3.	1.02E-02	.9	-5.14E-02	1.77E-03	1.51E-01
3618.00620	-7.	3 0 3	3 1 2	1.63E-01	3.	1.67E-01	-2.3	-4.27E-01	1.46E-02	3.75E-03
3618.04020	-76.	6 6 1	7 5 2	1.47E-03	5.	1.63E-03	-11.0	-1.07E-02	4.00E-04	-3.01E-02
3618.22970	-3.	6 6 0	7 5 3	5.23E-04	5.	5.44E-04	-3.9	-6.20E-03	2.31E-04	-1.73E-02
3619.43120	-52.	3 3 1	4 2 2	3.84E-04	10.	4.67E-04	-21.7	-5.14E-02	1.79E-03	7.12E-02
3619.91611	0.	0 0 0	1 1 1	5.56E-02	6.	5.36E-02	3.6	2.40E-01	-8.04E-03	0.00E+00
3623.20275	8.	1 1 1	2 0 2	3.20E-02	3.	3.33E-02	-4.0	-1.94E-01	6.53E-03	4.94E-03
3624.12387	-11.	5 5 1	6 4 2	3.62E-03	2.	3.59E-03	.8	-1.36E-02	5.07E-04	-4.68E-02
3624.60074	0.	9 3 6	10 2 9	5.17E-04	2.	5.01E-04	3.2	-6.01E-03	2.16E-04	-1.66E-02
3625.17928	7.	5 5 0	6 4 3	1.12E-02	4.	1.07E-02	4.5	-2.36E-02	8.77E-04	-8.07E-02
3626.20560	3.	4 4 1	5 3 2	2.59E-01	2.	2.58E-01	.5	-4.12E-02	1.50E-03	-4.68E-01
3630.76611	7.	2 0 2	2 1 1	7.40E-02	4.	7.37E-02	.5	-2.84E-01	9.97E-03	3.07E-03
3630.83037	1.	4 4 0	5 3 3	6.77E-02	3.	6.75E-02	.4	-2.42E-02	8.87E-04	-2.36E-01
3634.98243	1.	3 3 0	4 2 3	7.72E-03	2.	7.79E-03	-.9	-8.04E-02	2.88E-03	1.66E-01
3638.08202	21.	1 0 1	1 1 0	1.90E-01	2.	2.02E-01	-6.3	-4.72E-01	1.68E-02	6.01E-03
3639.93350	-35.	4 2 2	5 1 5	2.80E-02	6.	3.03E-02	-8.2	-3.48E-02	1.22E-03	2.08E-01
3643.90321	-9.	10 3 7	11 2 10	3.88E-05	3.	3.70E-05	4.7	-1.61E-03	5.87E-05	-4.53E-03
3644.32395	4.	10 5 6	11 2 9	5.55E-05	4.	5.76E-05	-3.8	2.15E-03	-7.41E-05	5.51E-03
3648.66751	-8.	5 2 3	6 1 6	4.98E-02	3.	5.15E-02	-3.4	-3.54E-02	1.26E-03	-1.93E-01
3652.38805	0.	6 4 3	5 5 0	2.04E-04	3.	1.98E-04	3.2	-1.75E-02	-8.40E-04	4.28E-03
3660.37585	6.	3 1 3	2 2 0	1.69E-03	2.	1.67E-03	1.4	-5.12E-02	2.07E-03	8.30E-03
3661.67712	20.	5 1 5	4 2 2	4.21E-04	2.	3.97E-04	5.6	-3.04E-02	1.33E-03	9.16E-03
3662.15295	-25.	5 3 3	4 4 0	1.75E-04	2.	1.66E-04	5.2	-2.25E-02	1.15E-03	8.50E-03
3663.04522	-2.	6 2 4	7 1 7	2.15E-03	2.	2.09E-03	2.6	-1.14E-02	4.21E-04	-3.48E-02
3664.30520	-14.	11 3 8	12 2 11	2.78E-05	3.	2.60E-05	6.4	-1.27E-03	4.53E-05	-3.87E-03
3665.41892	12.	4 1 4	3 2 1	3.51E-03	2.	3.37E-03	4.0	-7.89E-02	3.35E-03	1.75E-02
3665.83030	-7.	5 3 2	4 4 1	8.65E-04	2.	8.16E-04	5.7	-3.63E-02	1.85E-03	5.92E-03
3665.89647	-1.	4 2 3	3 3 0	2.31E-03	3.	2.21E-03	4.2	-6.81E-02	3.01E-03	1.81E-02
3674.69680	-2.	1 1 0	1 0 1	1.83E-01	2.	1.87E-01	-2.5	-4.51E-01	1.75E-02	0.00E+00
3678.24251	-6.	9 4 6	10 1 9	7.80E-05	2.	7.58E-05	2.9	2.39E-03	-8.68E-05	6.40E-03
3680.37349	-5.	2 1 1	2 0 2	6.68E-02	4.	6.66E-02	.3	-2.67E-01	1.06E-02	-1.51E-03
3681.09930	-3.	7 4 4	8 1 7	2.67E-04	2.	2.71E-04	-1.4	5.86E-03	-2.21E-04	1.08E-02
3681.28942	7.	5 2 4	4 3 1	7.03E-04	3.	6.76E-04	3.8	-4.09E-02	1.97E-03	1.29E-02
3681.33985	-12.	4 2 2	3 3 1	1.09E-03	2.	1.04E-03	4.2	-4.07E-02	1.88E-03	6.55E-03
3681.90366	-1.	7 2 5	8 1 8	1.60E-03	2.	1.57E-03	2.0	-1.09E-02	4.16E-04	-2.91E-02
3682.56867	-7.	6 3 4	5 4 1	4.78E-04	2.	4.30E-04	10.0	-4.10E-02	2.39E-03	1.79E-02
3682.95425	11.	10 4 7	11 1 10	7.90E-05	3.	7.72E-05	2.3	2.24E-03	-8.15E-05	6.63E-03
3683.60770	21.	8 2 7	7 3 4	6.30E-05	3.	5.09E-05	19.3	-1.89E-02	1.20E-03	1.05E-02
3683.75720	5.	10 6 5	11 3 8	7.00E-06	8.	5.48E-06	21.7	5.36E-04	-8.92E-06	1.81E-03

Table 9 continued

observed frequency	upper o-c	J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)%	Z(100)	Z(020)	Z(001)
3683.84830	75.	7 4 3	6 5 2	1.35E-05	7.	1.03E-05	23.4	-1.78E-02	-3.79E-03	1.84E-02
3687.53620	62.	8 5 4	9 2 7	1.49E-04	5.	1.48E-04	1.0	2.61E-03	-8.81E-05	9.62E-03
3690.63101	2.	3 1 2	3 0 3	1.46E-01	10.	1.44E-01	1.5	-3.90E-01	1.61E-02	-5.41E-03
3691.06230	2.	4 2 2	4 1 3	1.57E-02	5.	1.42E-02	9.5	-2.01E-01	8.57E-03	7.32E-02
3691.39775	-18.	3 2 1	3 1 2	1.05E-01	4.	1.02E-01	2.8	-3.83E-01	1.62E-02	4.77E-02
3692.49100	0.	3 1 2	2 2 1	1.34E-02	7.	1.33E-02	.5	-1.39E-01	6.16E-03	1.69E-02
3693.29340	-8.	1 1 1	0 0 0	4.02E-02	2.	4.20E-02	-4.6	2.10E-01	-8.73E-03	3.99E-03
3694.79355	8.	2 2 0	2 1 1	2.55E-02	4.	2.63E-02	-3.2	-1.89E-01	7.97E-03	1.91E-02
3696.46240	-3.	5 2 3	5 1 4	1.07E-01	3.	1.07E-01	.3	-2.71E-01	1.20E-02	-6.72E-02
3700.03840	-11.	7 3 5	6 4 2	7.10E-05	7.	6.53E-05	8.1	-1.89E-02	1.28E-03	9.51E-03
3702.58220	-9.	7 3 4	7 2 5	2.56E-02	10.	2.53E-02	1.3	-1.18E-01	5.72E-03	-4.64E-02
3703.59080	3.	5 3 3	6 0 6	1.00E-03	10.	1.02E-03	-2.0	9.99E-03	-3.96E-04	2.23E-02
3705.43792	12.	6 3 3	6 2 4	4.00E-02	4.	3.90E-02	2.5	-8.95E-02	4.24E-03	-1.12E-01
3705.49098	-4.	4 3 2	5 0 5	3.07E-03	6.	3.06E-03	.3	1.89E-02	-7.65E-04	3.71E-02
3705.75013	14.	4 1 3	4 0 4	2.77E-02	3.	2.69E-02	2.8	-1.68E-01	7.31E-03	-3.73E-03
3706.41703	21.	8 3 5	8 2 6	2.67E-03	3.	2.54E-03	5.0	-4.22E-02	2.13E-03	-1.03E-02
3706.61870	5.	6 2 4	6 1 5	1.27E-02	6.	1.31E-02	-3.5	-1.06E-01	4.92E-03	-1.37E-02
3706.66640	4.	6 3 4	7 0 7	2.20E-03	4.	1.92E-03	12.6	1.31E-02	-5.20E-04	3.13E-02
3707.42748	9.	5 3 2	5 2 3	4.31E-03	2.	4.48E-03	-4.0	-1.96E-01	9.14E-03	2.54E-01
3708.65082	5.	10 4 6	10 3 7	2.14E-04	6.	2.05E-04	4.4	-1.07E-02	7.58E-04	-4.34E-03
3709.19805	8.	2 2 1	2 1 2	5.35E-02	3.	5.35E-02	.0	-2.65E-01	1.16E-02	2.22E-02
3711.10211	-29.	2 1 2	1 0 1	1.47E-01	3.	1.48E-01	-.4	3.89E-01	-1.74E-02	1.31E-02
3711.87550	-19.	3 0 3	2 1 2	1.10E-01	5.	1.11E-01	-.9	-3.58E-01	1.65E-02	8.04E-03
3713.15863	14.	3 3 1	4 0 4	3.88E-04	2.	3.88E-04	.1	8.38E-03	-3.48E-04	1.17E-02
3713.75500	-3.	7 3 5	8 0 8	3.17E-04	2.	3.12E-04	1.6	5.06E-03	-2.01E-04	1.28E-02
3714.88100	3.	5 4 2	6 1 5	1.10E-03	10.	1.04E-03	5.7	2.20E-03	-8.71E-05	3.01E-02
3716.07409	4.	4 3 1	4 2 2	2.57E-04	2.	2.30E-04	10.5	-1.30E-01	6.13E-03	1.09E-01
3716.31330	2.	9 3 6	9 2 7	2.24E-03	3.	2.13E-03	4.9	-3.99E-02	2.16E-03	-8.43E-03
3716.59711	1.	3 2 2	3 1 3	1.97E-02	2.	1.99E-02	-.9	-1.59E-01	7.15E-03	1.06E-02
3718.88050	-36.	8 4 4	8 3 5	3.74E-03	10.	3.62E-03	3.3	-3.03E-02	1.43E-03	-3.12E-02
3721.85200	-29.	7 2 5	7 1 6	1.37E-02	10.	1.43E-02	-4.6	-1.12E-01	5.60E-03	-1.30E-02
3723.14970	-6.	9 2 7	10 1 10	1.50E-04	10.	1.57E-04	-4.6	-3.27E-03	1.32E-04	-9.39E-03
3723.18843	9.	3 3 0	3 2 1	1.15E-03	3.	1.10E-03	4.5	-2.08E-01	9.84E-03	1.65E-01
3723.83070	-6.	8 3 6	9 0 9	4.04E-04	2.	3.92E-04	3.0	5.39E-03	-2.17E-04	1.46E-02
3724.18830	9.	5 1 4	5 0 5	3.89E-02	4.	3.97E-02	-2.0	-2.03E-01	9.45E-03	-5.40E-03
3726.44880	-9.	3 1 3	2 0 2	4.75E-02	2.	4.83E-02	-1.8	2.23E-01	-1.06E-02	7.92E-03
3726.47670	3.	4 2 3	4 1 4	4.44E-02	3.	4.59E-02	-3.4	-2.37E-01	1.11E-02	1.17E-02
3728.26742	9.	7 3 4	6 4 3	5.63E-05	3.	4.51E-05	19.9	-3.24E-02	2.28E-03	2.34E-02
3728.90977	-6.	3 3 1	3 2 2	2.09E-03	4.	2.12E-03	-1.4	-1.17E-01	5.63E-03	6.50E-02
3730.08970	0.	7 4 3	7 3 4	4.24E-02	3.	4.21E-02	.7	-7.38E-02	3.89E-03	-1.35E-01
3730.47667	3.	4 3 2	4 2 3	1.64E-02	3.	1.62E-02	1.2	-2.10E-01	1.03E-02	7.24E-02
3731.07070	1.	10 3 7	10 2 8	1.86E-04	3.	1.77E-04	4.9	-1.15E-02	6.90E-04	-2.46E-03
3732.73869	13.	4 0 4	3 1 3	3.42E-02	2.	3.64E-02	-6.5	-2.04E-01	1.04E-02	2.88E-03
3734.07820	-43.	5 3 3	5 2 4	5.90E-03	7.	6.03E-03	-2.2	-1.03E-01	5.21E-03	2.01E-02
3740.39310	2.	6 4 2	6 3 3	4.41E-02	3.	4.41E-02	-.1	-5.45E-02	2.96E-03	-1.58E-01
3740.81353	2.	4 1 4	3 0 3	1.21E-01	2.	1.22E-01	-.7	3.58E-01	-1.88E-02	1.00E-02
3743.56562	10.	6 1 5	6 0 6	6.10E-03	8.	6.03E-03	1.1	-7.97E-02	4.00E-03	-1.97E-03
3745.48568	4.	6 4 3	6 3 4	3.00E-02	5.	3.09E-02	-3.1	-8.71E-02	4.88E-03	2.58E-01
3746.32280	19.	2 2 1	1 1 0	1.19E-01	2.	1.19E-01	.0	3.30E-01	-1.69E-02	3.18E-02
3747.42919	-5.	5 4 1	5 3 2	3.10E-01	2.	3.05E-01	1.7	-1.13E-01	6.21E-03	-4.45E-01
3747.49390	12.	9 5 4	9 4 5	2.73E-03	10.	2.74E-03	-.4	-2.09E-02	1.40E-03	-3.29E-02
3748.21051	3.	7 3 5	7 2 6	2.31E-03	3.	2.25E-03	2.7	-5.26E-02	2.92E-03	2.31E-03
3748.39170	-35.	11 3 8	11 2 9	1.34E-04	10.	1.18E-04	11.8	-9.40E-03	6.36E-04	-2.10E-03
3750.27813	2.	8 4 5	8 3 6	5.12E-04	4.	4.41E-04	13.8	-4.66E-02	2.73E-03	2.28E-02
3750.95590	-4.	4 4 0	4 3 1	1.50E-01	3.	1.48E-01	1.4	-6.74E-02	3.66E-03	-3.21E-01
3751.46970	1.	5 0 5	4 1 4	8.00E-02	3.	8.22E-02	-2.8	-3.06E-01	1.73E-02	2.03E-03
3752.13800	-63.	6 2 5	6 1 6	1.53E-02	10.	1.48E-02	3.5	-1.31E-01	6.84E-03	2.80E-03
3752.50069	-5.	4 4 1	4 3 2	5.50E-01	3.	5.54E-01	-.7	-1.13E-01	6.18E-03	-6.37E-01
3752.83227	-1.	2 2 0	1 1 1	3.10E-02	6.	3.64E-02	-17.5	1.72E-01	-8.99E-03	2.81E-02
3753.65230	-3.	10 5 6	10 4 7	3.77E-04	3.	4.17E-04	-10.7	-8.75E-03	6.54E-04	2.85E-02
3753.81862	-3.	5 4 2	5 3 3	1.74E-01	3.	1.74E-01	-.1	-5.42E-02	3.03E-03	-3.66E-01
3755.02946	-2.	9 4 6	9 3 7	1.55E-04	2.	1.40E-04	9.4	-1.62E-02	9.88E-04	3.35E-03
3755.40372	2.	5 1 5	4 0 4	2.70E-02	2.	2.87E-02	-6.5	1.76E-01	-1.01E-02	3.35E-03
3757.62852	3.	8 5 3	8 4 4	2.78E-03	4.	2.72E-03	2.1	-1.88E-02	1.25E-03	-3.46E-02
3758.39891	2.	8 3 6	8 2 7	3.00E-03	3.	2.86E-03	4.7	-5.71E-02	3.39E-03	2.42E-04
3758.62003	-3.	9 2 7	9 1 8	1.48E-03	3.	1.42E-03	4.3	-3.58E-02	2.17E-03	-4.02E-03
3761.67385	4.	10 4 7	10 3 8	2.05E-04	2.	1.83E-04	10.8	-1.55E-02	9.98E-04	9.36E-04
3762.17130	18.	7 1 6	7 0 7	7.25E-03	2.	7.52E-03	-3.7	-8.99E-02	4.91E-03	-1.72E-03
3763.69972	7.	3 2 2	2 1 1	3.13E-02	3.	3.20E-02	-2.1	1.61E-01	-9.06E-03	2.72E-02
3764.59916	1.	7 5 2	7 4 3	2.02E-02	2.	1.90E-02	6.1	-4.70E-02	3.09E-03	-9.38E-02
3767.46440	-7.	9 5 5	9 4 6	2.05E-03	2.	2.02E-03	1.6	-1.01E-02	7.25E-04	-3.55E-02
3768.09248	-1.	7 5 3	7 4 4	7.56E-03	4.	7.22E-03	4.6	-2.67E-02	1.77E-03	-6.00E-02
3768.68980	-4.	6 0 6	5 1 5	1.63E-02	4.	1.69E-02	-3.5	-1.39E-01	8.82E-03	2.35E-04
3768.94027	-3.	6 5 1	6 4 2	1.11E-02	2.	1.12E-02	-.5	-3.52E-02	2.27E-03	-7.27E-02

Table 9 continued

observed frequency	upper o-c	J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	ts	computed strength	(o-c)%	Z(100)	Z(020)	Z(001)
3770.45539	11.	6 1 6	5 0 5	5.30E-02	5.	5.17E-02	2.4	2.40E-01	-1.53E-02	2.94E-03
3771.56285	2.	5 5 0	5 4 1	4.02E-02	6.	3.88E-02	3.4	-6.51E-02	4.09E-03	-1.36E-01
3771.78962	-12.	5 5 1	5 4 2	1.32E-02	3.	1.30E-02	1.2	-3.75E-02	2.36E-03	-7.90E-02
3772.50993	2.	10 6 4	10 5 5	1.52E-04	2.	1.41E-04	7.0	-4.12E-03	3.65E-04	-8.13E-03
3774.05338	0.	6 1 5	5 2 4	4.68E-03	2.	4.54E-03	2.9	-7.96E-02	5.32E-03	6.91E-03
3774.43780	-5.	12 2 10	13 1 13	1.64E-06	10.	1.51E-06	7.7	-2.35E-04	9.31E-06	-1.00E-03
3774.47589	10.	12 6 7	12 5 8	5.16E-05	2.	4.96E-05	3.9	-1.77E-03	1.80E-04	-5.45E-03
3776.07016	1.	10 2 8	10 1 9	1.33E-04	2.	1.29E-04	3.1	-1.09E-02	7.36E-04	-1.18E-03
3777.94925	0.	4 2 3	3 1 2	6.45E-02	2.	6.69E-02	-3.8	2.27E-01	-1.41E-02	4.57E-02
3778.26173	-1.	10 6 5	10 5 6	5.16E-04	2.	4.83E-04	6.5	-6.98E-03	6.30E-04	-1.56E-02
3779.15124	-10.	9 6 3	9 5 4	1.40E-03	5.	1.27E-03	9.4	-1.21E-02	1.03E-03	-2.45E-02
3781.40069	2.	9 6 4	9 5 5	4.67E-04	2.	4.44E-04	4.9	-6.94E-03	5.95E-04	-1.47E-02
3781.80144	2.	8 2 7	8 1 8	2.59E-03	2.	2.66E-03	-2.6	-5.52E-02	3.33E-03	3.48E-04
3782.63200	1.	10 3 8	10 2 9	3.26E-04	2.	3.10E-04	4.9	-1.81E-02	1.30E-03	-8.19E-04
3783.73063	4.	8 6 2	8 5 3	1.11E-03	2.	1.04E-03	6.7	-1.09E-02	8.88E-04	-2.22E-02
3784.46020	-45.	8 6 3	8 5 4	3.23E-03	10.	3.15E-03	2.4	-1.88E-02	1.54E-03	-3.89E-02
3784.93216	3.	7 0 7	6 1 6	2.70E-02	3.	2.62E-02	2.8	-1.74E-01	1.26E-02	-1.94E-04
3785.26758	23.	3 2 1	2 1 2	9.41E-02	2.	9.48E-02	-8	1.96E-01	-1.20E-02	1.24E-01
3785.68771	3.	7 1 7	6 0 6	8.78E-03	2.	8.85E-03	-8	1.00E-01	-7.25E-03	8.31E-04
3787.12693	-4.	7 6 2	7 5 3	2.09E-03	2.	2.00E-03	4.4	-1.52E-02	1.18E-03	-3.07E-02
3789.24375	1.	6 6 0	6 5 1	2.74E-03	2.	2.56E-03	6.5	-1.73E-02	1.29E-03	-3.46E-02
3789.27742	-25.	6 6 1	6 5 2	8.13E-03	2.	7.69E-03	5.5	-2.99E-02	2.23E-03	-6.00E-02
3789.63483	0.	5 2 4	4 1 3	1.30E-02	2.	1.35E-02	-4.0	1.03E-01	-7.13E-03	1.99E-02
3790.43120	-2.	11 7 4	11 6 5	5.68E-05	2.	4.98E-05	12.3	-2.10E-03	2.69E-04	-5.22E-03
3791.82180	12.	11 7 5	11 6 6	1.89E-05	4.	1.70E-05	10.3	-1.20E-03	1.55E-04	-3.07E-03
3791.95625	-5.	11 2 9	11 1 10	1.01E-04	2.	9.57E-05	5.3	-9.50E-03	7.20E-04	-9.99E-04
*3793.49070	-3.	10 10 1	10 9 2	3.52E-06	4.	4.13E-06	-17.2	-3.35E-04	-2.61E-04	-1.44E-03
3795.16811	7.	10 7 3	10 6 4	6.28E-05	4.	5.48E-05	12.7	-2.24E-03	2.65E-04	-5.43E-03
3795.50326	-2.	7 1 6	6 2 5	7.42E-03	3.	7.45E-03	-5	-1.00E-01	7.93E-03	5.74E-03
3795.64228	-4.	10 7 4	10 6 5	1.80E-04	2.	1.66E-04	7.9	-3.87E-03	4.58E-04	-9.46E-03
3795.79848	-11.	9 1 8	9 0 9	9.55E-04	3.	9.70E-04	-1.6	-3.30E-02	2.15E-03	-2.90E-04
3796.89442	-3.	9 2 8	9 1 9	2.93E-04	3.	3.11E-04	-6.2	-1.89E-02	1.25E-03	5.34E-05
3798.58304	-1.	3 3 0	3 0 3	9.27E-04	2.	9.01E-04	2.8	2.40E-02	-1.41E-03	-5.26E-02
3798.80066	-2.	9 7 2	9 6 3	4.89E-04	2.	4.51E-04	7.7	-6.53E-03	7.15E-04	-1.54E-02
3798.93532	-1.	9 7 3	9 6 4	1.53E-04	6.	1.51E-04	1.4	-3.77E-03	4.12E-04	-8.93E-03
3799.04741	7.	3 3 1	2 2 0	4.25E-02	3.	4.30E-02	-1.2	1.50E-01	-1.00E-02	6.75E-02
3799.93351	4.	6 2 5	5 1 4	2.10E-02	2.	2.14E-02	-1.7	1.35E-01	-1.04E-02	2.13E-02
3800.44303	-3.	3 3 0	2 2 1	1.64E-01	2.	1.63E-01	.4	2.57E-01	-1.73E-02	1.65E-01
3800.81936	5.	8 1 8	7 0 7	1.18E-02	3.	1.17E-02	1.1	1.17E-01	-9.71E-03	7.15E-04
3800.87802	-3.	8 0 8	7 1 7	2.33E-03	3.	2.45E-03	-5.3	-5.41E-02	5.51E-03	-9.13E-04
*3803.83300	124.	7 7 0	7 6 1	2.01E-03	2.	1.90E-03	5.3	-1.38E-02	1.32E-03	-3.11E-02
3804.49620	-13.	12 8 5	12 7 6	5.45E-06	3.	4.51E-06	17.2	-5.14E-04	1.19E-04	-1.73E-03
3804.73850	0.	12 3 10	12 2 11	1.55E-05	6.	1.33E-05	14.5	-3.33E-03	1.03E-04	-4.12E-04
3808.07790	0.	11 8 3	11 7 4	2.09E-05	2.	1.70E-05	18.8	-1.04E-03	2.10E-04	-3.29E-03
3808.16700	-115.	11 8 4	11 7 5	7.10E-06	10.	5.66E-06	20.3	-6.02E-04	1.21E-04	-1.90E-03
3808.17280	-19.	4 4 0	5 1 5	3.62E-05	10.	3.67E-05	-1.4	3.09E-04	-1.32E-05	5.76E-03
3808.98920	26.	5 4 1	6 1 6	8.23E-05	4.	8.18E-05	.5	5.10E-04	-1.85E-05	8.56E-03
3810.23630	26.	7 5 2	8 2 7	1.83E-05	3.	1.69E-05	7.6	7.96E-04	-1.48E-05	3.33E-03
3810.32570	9.	7 2 6	6 1 5	3.30E-03	2.	3.26E-03	1.2	5.56E-02	-4.86E-03	6.38E-03
3811.23600	-22.	10 8 2	10 7 3	2.20E-05	5.	1.78E-05	19.1	-1.11E-03	1.97E-04	-3.30E-03
3811.79710	12.	10 2 9	10 1 10	2.70E-04	2.	2.91E-04	-7.9	-1.84E-02	1.35E-03	2.22E-05
3813.79910	-7.	9 8 1	9 7 2	1.51E-04	2.	1.33E-04	12.2	-3.14E-03	4.96E-04	-8.87E-03
3813.80340	-40.	9 8 2	9 7 3	5.06E-05	2.	4.42E-05	12.7	-1.81E-03	2.86E-04	-5.12E-03
3813.98079	9.	8 1 7	7 2 6	1.09E-03	2.	1.08E-03	.7	-3.77E-02	3.58E-03	1.20E-03
3815.54495	-2.	9 0 9	8 1 8	4.17E-03	3.	4.34E-03	-4.1	-7.27E-02	7.06E-03	-2.03E-04
3815.68850	6.	9 1 9	8 0 8	1.40E-03	10.	1.45E-03	-3.5	4.20E-02	-4.11E-03	2.17E-04
3818.68263	7.	4 3 2	3 2 1	9.66E-02	2.	9.51E-02	1.5	1.84E-01	-1.43E-02	1.39E-01
*3823.84400	38.	11 9 2	11 8 3	7.90E-06	7.	5.92E-06	25.0	-5.30E-04	2.27E-04	-2.13E-03
3824.28073	-10.	4 2 2	3 1 3	9.85E-02	2.	9.90E-02	-5	6.16E-02	-4.74E-03	2.58E-01
3825.55220	4.	4 3 1	3 2 2	7.88E-02	2.	7.62E-02	3.3	9.90E-02	-7.94E-03	1.85E-01
*3825.69410	-7.	10 9 2	10 8 3	2.18E-05	2.	1.74E-05	20.3	-9.61E-04	3.44E-04	-3.55E-03
3826.07851	1.	11 1 10	11 0 11	7.25E-05	2.	8.13E-05	-12.1	-9.77E-03	7.88E-04	-3.54E-05
3826.41630	-58.	11 2 10	11 1 11	2.68E-05	10.	2.65E-05	1.1	-5.62E-03	4.64E-04	8.58E-06
*3827.18060	0.	9 9 0	9 8 1	3.82E-05	4.	3.35E-05	12.4	-1.40E-03	4.35E-04	-4.82E-03
3828.59021	5.	5 3 2	5 0 5	2.22E-02	3.	2.23E-02	-.3	2.33E-02	-1.58E-03	-1.71E-01
3828.99260	0.	5 5 0	6 2 5	1.58E-05	4.	1.56E-05	1.4	6.98E-04	-2.27E-05	3.27E-03
3830.15211	-4.	10 0 10	9 1 9	4.22E-04	2.	4.51E-04	-6.9	-2.40E-02	2.85E-03	-8.89E-05
3830.21929	-6.	10 1 10	9 0 9	1.29E-03	2.	1.36E-03	-5.2	4.16E-02	-4.98E-03	2.22E-04
3830.36670	-2.	9 1 8	8 2 7	1.14E-03	2.	1.11E-03	2.6	-3.83E-02	4.48E-03	5.33E-04
3834.21419	8.	9 2 8	8 1 7	4.02E-04	2.	4.07E-04	-1.4	2.16E-02	-2.67E-03	1.22E-03
3834.50810	27.	5 3 3	4 2 2	1.62E-02	6.	1.67E-02	-3.2	7.12E-02	-6.45E-03	6.46E-02
3841.48270	-30.	12 2 11	12 1 12	1.65E-05	10.	1.60E-05	3.3	-4.56E-03	4.92E-04	7.36E-05
3844.35170	37.	11 0 11	10 1 10	2.95E-04	6.	3.39E-04	-14.8	-2.16E-02	3.32E-03	-1.33E-04
3844.40420	-32.	11 1 11	10 0 10	1.03E-04	2.	1.13E-04	-9.3	1.24E-02	-1.95E-03	1.08E-04

Table 9 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(100)	Z(020)	Z(001)
3845.40158	11.	10 1 9	9 2 8	1.00E-04	2.	9.84E-05	1.6	-1.17E-02	1.77E-03	1.88E-05
3846.39921	-2.	6 3 4	5 2 3	2.04E-02	3.	2.11E-02	-3.4	7.93E-02	-8.44E-03	7.44E-02
3847.26742	15.	10 2 9	9 1 8	3.15E-04	2.	3.13E-04	.5	2.00E-02	-3.16E-03	8.89E-04
3849.57930	19.	4 4 0	3 3 1	3.32E-02	3.	3.17E-02	4.6	8.38E-02	-8.00E-03	-2.54E-01
3849.59904	-1.	4 4 1	3 3 0	1.47E-01	5.	1.42E-01	3.6	1.41E-01	-1.35E-02	-5.04E-01
3853.57572	-6.	5 3 2	4 2 3	4.95E-01	3.	4.93E-01	.4	9.38E-02	-9.54E-03	6.18E-01
3855.04530	10.	7 3 5	6 2 4	2.44E-03	2.	2.48E-03	-1.4	2.84E-02	-3.58E-03	2.49E-02
3856.78385	7.	5 4 1	5 1 4	2.02E-02	4.	2.06E-02	-1.8	9.25E-03	-7.45E-04	1.35E-01
3857.62422	-4.	12 1 12	11 0 11	4.87E-05	4.	6.00E-05	-23.2	9.56E-03	-1.49E-03	-3.19E-04
3859.03617	-4.	6 4 2	6 1 5	6.39E-03	2.	6.40E-03	-.1	6.20E-03	-5.11E-04	7.43E-02
3859.30147	5.	4 4 0	4 1 3	3.28E-03	2.	3.28E-03	-.1	3.05E-03	-2.43E-04	5.45E-02
3860.51680	46.	11 2 10	10 1 9	1.68E-05	10.	1.94E-05	-15.7	5.38E-03	-1.22E-03	2.49E-04
3861.51470	0.	6 3 3	6 0 6	8.95E-03	10.	9.29E-03	-3.7	6.74E-03	-5.43E-04	9.02E-02
3867.52950	-14.	9 3 7	8 2 6	1.83E-04	2.	1.80E-04	1.4	9.38E-03	-1.81E-03	5.86E-03
3868.23225	0.	7 4 3	7 1 6	9.36E-03	3.	9.18E-03	1.9	8.98E-03	-7.85E-04	8.76E-02
3871.08168	12.	5 2 3	4 1 4	4.68E-02	2.	4.51E-02	3.7	4.94E-02	-5.39E-03	-2.56E-01
3873.72440	-1.	5 4 1	4 3 2	2.40E-01	4.	2.42E-01	-.9	8.37E-02	-1.02E-02	-5.66E-01
3873.94422	-1.	5 4 2	4 3 1	1.88E-01	3.	1.84E-01	2.0	4.05E-02	-4.94E-03	-4.65E-01
3892.00251	-5.	6 3 3	5 2 4	1.09E-01	2.	1.08E-01	1.2	2.32E-02	-3.52E-03	-3.48E-01
3893.77003	3.	5 5 1	4 4 0	5.10E-04	2.	4.04E-04	20.8	4.04E-02	-6.24E-03	-5.42E-02
3893.79629	-1.	5 5 0	4 4 1	1.39E-03	4.	1.18E-03	15.4	6.99E-02	-1.08E-02	-9.33E-02
3897.97382	-7.	6 4 2	5 3 3	7.29E-02	2.	6.91E-02	5.3	2.48E-02	-4.17E-03	-2.83E-01
3898.74910	53.	7 3 4	7 0 7	2.10E-03	6.	2.06E-03	2.1	5.67E-03	-5.72E-04	4.02E-02
3902.44078	3.	7 4 4	6 3 3	1.75E-02	2.	1.74E-02	.3	1.44E-02	-3.13E-03	1.21E-01
3905.80763	1.	9 5 4	9 2 7	4.07E-04	2.	3.99E-04	2.0	1.89E-03	-2.78E-04	1.84E-02
3906.49242	8.	8 5 3	8 2 6	2.42E-04	2.	2.32E-04	4.1	1.50E-03	-1.96E-04	1.39E-02
3910.17943	19.	4 4 1	4 1 4	2.24E-03	3.	2.28E-03	-1.6	9.23E-04	-1.21E-04	4.69E-02
3913.04130	-68.	9 4 5	9 1 8	3.45E-04	4.	2.66E-04	23.0	1.63E-03	-1.28E-04	1.48E-02
3913.42639	-4.	7 5 2	7 2 5	7.85E-04	2.	7.73E-04	1.6	2.71E-03	-3.33E-04	2.54E-02
3913.44010	5.	10 5 5	10 2 8	6.00E-05	10.	4.77E-05	20.5	5.62E-04	-1.05E-04	6.45E-03
3914.03749	4.	8 4 5	7 3 4	8.95E-03	3.	9.22E-03	-3.0	1.05E-02	-3.52E-03	8.91E-02
3916.37920	20.	6 5 2	5 4 1	1.50E-02	8.	1.25E-02	16.6	3.35E-02	-7.85E-03	-1.37E-01
3916.60601	-5.	6 5 1	5 4 2	4.11E-03	3.	3.90E-03	5.1	1.93E-02	-4.54E-03	-7.72E-02
3921.10308	1.	9 4 6	8 3 5	4.95E-04	2.	5.01E-04	-1.2	1.94E-03	-1.24E-03	2.17E-02
3922.89902	6.	6 2 4	5 1 5	1.88E-03	2.	1.69E-03	10.0	9.85E-03	-1.99E-03	-4.90E-02
3923.46764	4.	7 4 3	6 3 4	9.95E-02	2.	9.63E-02	3.2	1.70E-02	-4.82E-03	-3.22E-01
3923.94709	10.	6 5 1	6 2 4	1.82E-04	2.	1.83E-04	-.5	1.26E-03	-1.50E-04	1.24E-02
3924.88295	0.	10 4 7	9 3 6	2.00E-04	10.	2.07E-04	-3.7	3.67E-04	-1.26E-03	1.53E-02
3926.90440	40.	11 4 8	10 3 7	7.00E-06	3.	6.66E-06	4.9	-3.95E-04	-4.16E-04	3.39E-03
3931.16133	5.	5 4 2	5 1 5	9.53E-04	3.	9.66E-04	-1.4	-3.16E-05	-4.17E-05	3.12E-02
3932.08050	-23.	7 3 4	6 2 5	2.62E-02	2.	2.45E-02	6.6	1.25E-02	-4.05E-03	-1.65E-01
3935.39346	14.	5 5 0	5 2 3	2.09E-04	2.	2.13E-04	-2.1	1.30E-03	-1.50E-04	1.35E-02
*3935.80000	-12.	6 6 1	5 5 0	9.72E-04	2.	8.72E-04	10.3	2.16E-02	-7.99E-03	-4.31E-02
3938.05622	2.	7 5 3	6 4 2	7.18E-03	2.	6.84E-03	4.7	6.44E-03	-3.08E-03	-8.61E-02
3939.11133	-14.	7 5 2	6 4 3	1.69E-02	3.	1.68E-02	.3	1.09E-02	-5.37E-03	-1.35E-01
3945.26480	-7.	8 3 5	8 0 8	9.45E-05	2.	9.26E-05	2.0	1.09E-03	-1.62E-04	8.69E-03
3948.83689	-1.	11 6 5	11 3 8	1.35E-05	6.	1.08E-05	20.2	3.66E-05	-5.55E-05	3.30E-03
3952.34433	4.	8 4 4	7 3 5	9.33E-03	2.	8.86E-03	5.0	1.01E-03	-1.54E-03	-9.36E-02
3953.78200	-9.	10 4 6	10 1 9	2.30E-05	10.	2.04E-05	11.2	2.99E-04	-9.25E-05	4.31E-03
3958.14097	0.	7 6 2	6 5 1	9.80E-04	3.	9.20E-04	6.2	1.54E-03	-2.76E-03	-2.91E-02
3958.17712	-10.	7 6 1	6 5 2	2.93E-03	2.	2.75E-03	6.2	2.65E-03	-4.77E-03	-5.03E-02
3958.21998	1.	8 5 4	7 4 3	2.34E-02	3.	2.24E-02	4.3	-2.95E-05	-3.33E-03	-1.46E-01
3965.69558	15.	5 5 1	5 2 4	4.25E-05	3.	4.50E-05	-5.9	4.27E-04	-5.96E-05	6.34E-03
3967.56207	7.	6 3 4	5 0 5	3.50E-03	2.	3.02E-03	13.7	-5.33E-03	2.41E-03	5.79E-02
3973.52970	10.	9 6 3	9 3 6	3.64E-05	6.	3.45E-05	5.3	1.28E-04	-7.77E-05	5.82E-03
3973.80880	2.	6 5 2	6 2 5	2.06E-04	10.	2.40E-04	-16.4	7.54E-04	-1.37E-04	1.49E-02
3974.75301	5.	10 5 6	9 4 5	7.50E-03	4.	7.80E-03	-4.0	-3.44E-03	-9.95E-04	9.27E-02
*3974.96800	-32.	7 7 0	6 6 1	6.57E-04	2.	6.53E-04	.6	-2.77E-03	-4.72E-03	-1.81E-02
3976.57377	-1.	9 5 5	8 4 4	7.21E-03	2.	7.48E-03	-3.8	-2.08E-03	-1.05E-03	-8.34E-02
3978.81409	11.	7 2 5	6 1 6	2.41E-03	2.	2.01E-03	16.6	1.05E-03	-2.19E-03	-4.37E-02
3979.72046	14.	8 3 5	7 2 6	1.78E-03	2.	1.61E-03	9.8	-1.18E-03	-1.35E-03	-3.75E-02
3979.79188	-8.	8 6 3	7 5 2	3.12E-03	4.	3.23E-03	-3.4	-4.90E-03	-3.11E-03	-4.88E-02
3979.99545	-3.	8 6 2	7 5 3	1.08E-03	3.	1.06E-03	2.2	-2.85E-03	-1.79E-03	-2.79E-02
3982.28982	12.	5 4 2	4 1 3	1.67E-02	5.	1.62E-02	2.7	2.78E-04	3.44E-04	-1.28E-01
3985.02062	4.	9 5 4	8 4 5	7.24E-03	2.	7.21E-03	.4	-5.42E-03	-2.05E-03	-7.75E-02
3985.07838	2.	11 5 7	10 4 6	2.02E-04	2.	2.00E-04	.8	-1.80E-03	-3.59E-04	1.638E-02
3986.00571	9.	9 4 5	8 3 6	3.92E-03	3.	3.64E-03	7.0	-4.11E-03	-5.74E-04	-5.57E-02
3986.22833	16.	7 5 3	7 2 6	7.24E-05	2.	7.16E-05	1.1	2.12E-04	-7.00E-05	8.32E-03
3988.75786	27.	12 5 8	11 4 7	4.25E-05	2.	3.76E-05	11.6	-2.08E-03	-3.29E-04	8.54E-03
3992.52001	4.	4 4 0	3 1 3	1.66E-03	2.	1.70E-03	-2.4	9.90E-05	1.42E-04	-4.15E-02
3995.00680	-1.	6 4 3	5 1 4	3.33E-02	3.	3.34E-02	-.3	-1.71E-03	1.48E-03	1.83E-01
3997.07450	-38.	8 7 2	7 6 1	8.70E-04	2.	8.54E-04	1.9	-6.82E-03	-2.67E-03	-1.97E-02
3997.08030	121.	8 7 1	7 6 2	2.90E-04	2.	2.85E-04	1.7	-3.94E-03	-1.54E-03	-1.14E-02
3998.06658	14.	9 3 6	9 0 9	4.70E-05	3.	4.61E-05	1.9	3.33E-04	-1.23E-04	6.58E-03

Table 9 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t	Z(100)	Z(020)	Z(001)
4000.46993	2.	9 6 4	8 5 3	8.25E-04	2.	8.02E-04	2.7	-4.04E-03	-1.10E-03	-2.32E-02
4001.28186	-9.	9 6 3	8 5 4	2.37E-03	2.	2.28E-03	3.8	-7.11E-03	-1.90E-03	-3.87E-02
4003.85666	-20.	8 5 4	8 2 7	1.45E-04	2.	1.24E-04	14.5	-1.48E-04	-7.48E-05	1.14E-02
4004.41950	13.	7 6 1	7 3 4	3.44E-05	3.	3.51E-05	-2.0	1.19E-04	-5.20E-05	5.86E-03
4010.52372	-6.	10 5 5	9 4 6	9.52E-04	2.	9.07E-04	4.7	-3.48E-03	-6.58E-04	-2.60E-02
4011.12236	26.	7 3 5	6 0 6	7.95E-04	3.	6.70E-04	15.8	1.56E-03	1.06E-03	2.33E-02
*4011.73490	-4.	8 8 1	7 7 0	2.91E-04	3.	3.13E-04	-7.6	-7.71E-03	-2.86E-03	-7.13E-03
4012.23136	-2.	8 4 5	8 1 8	3.77E-05	5.	3.71E-05	1.5	6.92E-04	-1.58E-04	5.56E-03
4016.32790	42.	6 6 0	6 3 3	5.38E-06	7.	5.91E-06	-9.8	5.37E-05	-1.66E-05	2.39E-03
4018.53920	28.	9 7 3	8 6 2	2.36E-04	3.	2.40E-04	-1.6	-4.29E-03	-9.50E-04	-1.02E-02
4018.57230	5.	9 7 2	8 6 3	7.22E-04	3.	7.18E-04	.6	-7.43E-03	-1.65E-03	-1.77E-02
4019.68314	-4.	10 6 5	9 5 4	1.42E-03	2.	1.40E-03	1.4	-6.24E-03	-1.08E-03	-3.01E-02
4021.08398	10.	7 4 4	6 1 5	3.68E-03	3.	3.51E-03	4.7	1.76E-03	8.78E-04	5.66E-02
4022.23450	-5.	10 6 4	9 5 5	4.28E-04	2.	4.05E-04	5.3	-3.73E-03	-6.26E-04	-1.58E-02
4027.96450	59.	9 5 5	9 2 8	1.65E-05	3.	1.50E-05	9.0	-3.10E-04	-9.92E-06	4.20E-03
4028.89812	41.	6 6 1	6 3 4	1.65E-05	3.	1.61E-05	2.5	3.21E-05	-2.13E-05	4.00E-03
4030.07950	12.	7 6 2	7 3 5	9.60E-06	7.	9.08E-06	5.4	-3.10E-05	-1.79E-05	3.06E-03
4030.56900	0.	10 4 6	9 3 7	4.57E-04	2.	4.33E-04	5.2	-3.32E-03	-6.76E-04	-1.68E-02
4031.40320	29.	5 4 1	4 1 4	6.25E-03	2.	6.58E-03	-5.3	1.55E-03	3.21E-04	-8.30E-02
4032.63450	-7.	9 3 6	8 2 7	1.69E-03	4.	1.44E-03	14.6	-6.77E-03	-1.29E-03	-2.99E-02
4033.51160	13.	8 6 3	8 3 6	2.63E-05	5.	2.43E-05	7.7	-1.80E-04	-3.08E-05	5.14E-03
*4033.69710	8.	9 8 1	8 7 2	2.98E-04	3.	3.12E-04	-4.8	-7.47E-03	-1.77E-03	-8.43E-03
4036.42697	1.	8 2 6	7 1 7	4.53E-04	3.	3.68E-04	18.8	-3.32E-03	-7.96E-04	-1.51E-02
4036.69705	-2.	11 6 6	10 5 5	2.35E-04	2.	2.34E-04	.3	-2.57E-03	-3.29E-04	-1.24E-02
4039.23234	2.	10 7 4	9 6 3	4.28E-04	3.	4.24E-04	1.0	-6.18E-03	-9.52E-04	-1.35E-02
*4039.27660	4.	10 10 1	9 9 0	3.50E-06	10.	3.57E-06	-1.9	-2.70E-03	1.53E-03	-7.20E-04
4039.38420	-23.	10 7 3	9 6 4	1.42E-04	2.	1.41E-04	1.0	-3.58E-03	-5.50E-04	-7.73E-03
4039.99866	24.	11 5 6	10 4 7	7.92E-04	2.	7.56E-04	4.5	-4.88E-03	-5.79E-04	-2.20E-02
4040.15010	-9.	9 6 4	9 3 7	5.05E-06	4.	4.77E-06	5.5	-1.62E-04	-1.34E-05	2.36E-03
4043.34121	-28.	11 6 5	10 5 6	5.06E-04	2.	5.05E-04	.2	-4.81E-03	-5.78E-04	-1.71E-02
4047.13520	-3.	14 6 9	13 5 8	9.30E-06	5.	1.00E-05	-7.6	-7.18E-04	-5.54E-05	3.94E-03
4050.85335	-4.	12 6 7	11 5 6	3.40E-04	3.	3.36E-04	1.0	-2.64E-03	-2.72E-04	-1.54E-02
4051.05120	45.	9 4 6	9 1 9	6.00E-06	4.	5.56E-06	7.3	1.59E-05	-4.76E-05	2.39E-03
4052.18013	13.	8 4 5	7 1 6	4.10E-03	2.	3.65E-03	11.0	6.72E-03	1.24E-03	5.24E-02
4055.01600	-9.	10 8 3	9 7 2	1.38E-04	3.	1.48E-04	-7.0	-5.13E-03	-8.94E-04	-6.13E-03
4055.02200	38.	10 8 2	9 7 3	4.60E-05	3.	4.92E-05	-7.0	-2.96E-03	-5.16E-04	-3.54E-03
4056.55620	11.	5 5 0	5 0 5	3.90E-06	4.	4.06E-06	-4.2	4.73E-05	3.35E-06	-2.07E-03
4057.75572	16.	8 3 6	7 0 7	1.51E-03	2.	1.24E-03	18.0	6.96E-03	1.28E-03	2.69E-02
4058.95740	-12.	11 7 5	10 6 4	6.67E-05	4.	6.52E-05	2.2	-2.54E-03	-2.98E-04	-5.24E-03
4059.50450	-5.	11 7 4	10 6 5	1.93E-04	3.	1.93E-04	.2	-4.42E-03	-5.16E-04	-8.95E-03
4062.88270	-25.	13 6 8	12 5 7	5.37E-05	2.	5.39E-05	-.4	-7.16E-04	-6.24E-05	-6.57E-03
*4062.92100	0.	11 10 1	10 9 2	3.27E-06	4.	3.03E-06	7.4	-1.82E-03	8.22E-04	-7.40E-04
4065.48795	0.	12 6 6	11 5 7	5.59E-05	2.	5.51E-05	1.3	-1.81E-03	-1.65E-04	-5.45E-03
4066.12470	7.	5 5 1	4 2 2	8.11E-05	2.	9.43E-05	-16.3	6.07E-04	1.21E-04	-1.04E-02
4075.31655	3.	6 4 2	5 1 5	1.32E-03	2.	1.37E-03	-3.6	1.71E-03	1.75E-04	-3.89E-02
4075.61250	0.	11 8 4	10 7 3	2.29E-05	2.	2.35E-05	-2.5	-2.06E-03	-2.84E-04	-2.50E-03
4075.63840	1.	11 8 3	10 7 4	6.86E-05	2..	7.02E-05	-2.3	-3.56E-03	-4.91E-04	-4.32E-03
4077.38507	0.	12 7 6	11 6 5	7.57E-05	2.	7.48E-05	1.1	-2.77E-03	-2.62E-04	-5.62E-03
4078.44116	18.	11 4 7	10 3 8	3.56E-04	2.	3.25E-04	8.7	-4.92E-03	-5.36E-04	-1.26E-02
4079.02548	0.	12 7 5	11 6 6	2.31E-05	4.	2.39E-05	-3.6	-1.62E-03	-1.51E-04	-3.12E-03
4080.02470	81.	6 5 1	6 0 6	2.11E-06	10.	2.04E-06	3.1	9.86E-05	-1.85E-06	-1.53E-03
4080.20947	-2.	6 5 2	5 2 3	5.27E-04	2.	5.88E-04	-11.5	2.47E-03	3.41E-04	-2.71E-02
4081.54208	37.	5 5 0	4 2 3	2.17E-04	2.	2.43E-04	-12.0	1.20E-03	1.78E-04	-1.70E-02
*4083.71100	42.	11 11 0	10 10 1	1.91E-06	10.	2.13E-06	-11.6	-1.44E-03	2.46E-04	-2.63E-04
*4085.47800	-26.	12 10 3	11 9 2	1.50E-06	10.	1.78E-06	-18.4	-1.16E-03	3.89E-04	-5.64E-04
4088.37048	7.	9 4 6	8 1 7	5.57E-04	2.	4.78E-04	14.3	4.65E-03	5.03E-04	1.67E-02
4088.65397	11.	10 3 7	9 2 8	2.01E-04	2.	1.73E-04	14.1	-4.04E-03	-4.00E-04	-8.70E-03
4090.00641	0.	13 6 7	12 5 8	4.40E-05	3.	4.29E-05	2.6	-1.84E-03	-1.31E-04	-4.57E-03
4090.56130	45.	8 7 2	8 4 5	2.10E-06	10.	2.29E-06	-8.8	-2.05E-04	7.86E-06	1.71E-03
*4091.82490	-7.	11 9 2	10 8 3	2.86E-05	2.	3.31E-05	-15.8	2.89E-03	-6.96E-04	-2.17E-03
4093.06305	16.	7 5 3	6 2 4	2.39E-04	2.	2.66E-04	-11.4	2.31E-03	2.43E-04	-1.89E-02
4093.25260	42.	10 4 7	10 1 10	5.90E-06	10.	5.25E-06	11.1	-2.34E-04	-3.70E-05	2.56E-03
4093.53688	-9.	9 2 7	8 1 8	7.97E-04	2.	6.27E-04	21.4	-7.66E-03	-8.52E-04	-1.65E-02
4093.97660	4.	13 7 7	12 6 6	7.65E-06	5.	8.20E-06	-7.2	-9.08E-04	-7.13E-05	-1.88E-03
4095.39040	4.	12 8 5	11 7 4	2.71E-05	2.	2.71E-05	.0	-2.23E-03	-2.54E-04	-2.72E-03
4098.22000	19.	13 7 6	12 6 7	2.25E-05	4.	2.22E-05	1.2	-1.62E-03	-1.24E-04	-2.97E-03
4106.37772	3.	9 3 7	8 0 8	2.95E-04	3.	2.32E-04	21.4	4.65E-03	4.76E-04	1.01E-02
4107.04736	11.	8 5 4	7 2 5	8.83E-04	2.	9.63E-04	-9.1	5.14E-03	4.28E-04	-3.66E-02
4107.97980	21.	14 7 8	13 6 7	7.20E-06	8.	7.18E-06	.3	-8.08E-04	-5.41E-05	-1.82E-03
4110.51187	12.	6 5 1	5 2 4	1.20E-04	3.	1.36E-04	-13.3	1.54E-03	1.39E-04	-1.33E-02
4111.94650	3.	11 3 8	11 0 11	2.02E-06	4.	1.61E-06	20.2	-2.56E-04	-1.36E-05	1.54E-03
4112.84400	-2.	12 9 4	11 8 3	8.32E-06	3.	9.49E-06	-14.0	-1.53E-03	-3.22E-04	-1.22E-03
4112.84800	10.	12 9 3	11 8 4	2.78E-06	3.	3.16E-06	-13.7	-8.85E-04	-1.86E-04	-7.07E-04
4114.21390	0.	13 8 6	12 7 5	2.70E-06	8.	2.90E-06	-7.3	-7.38E-04	-7.13E-05	-8.93E-04

Table 9 continued

observed frequency	upper o-c	J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	%s	computed strength	(o-c)%	Z(100)	Z(020)	Z(001)
4114.55840	0.	13	8	5	12	7	6	7.74E-06	3.	8.65E-06	-11.7	-1.28E-03	-1.24E-04	-1.54E-03
4117.62800	14.	14	7	7	13	6	8	1.80E-06	10.	1.92E-06	-6.6	-4.98E-04	-3.14E-05	-8.56E-04
4118.51620	23.	14	6	8	13	5	9	3.30E-06	10.	4.00E-06	-21.2	-5.39E-04	-3.89E-05	-1.42E-03
4125.19408	14.	7	4	3	6	1	6	1.28E-03	3.	1.38E-03	-8.0	3.69E-03	2.36E-04	-4.11E-02
4125.43771	8.	9	5	5	8	2	6	3.91E-04	2.	4.29E-04	-9.8	3.01E-03	1.89E-04	-2.39E-02
4128.72265	17.	10	4	7	9	1	8	6.68E-04	4.	5.79E-04	13.3	7.42E-03	5.43E-04	1.61E-02
4131.06550	-9.	12	4	8	11	3	9	3.07E-05	2.	2.75E-05	10.5	-1.97E-03	-1.36E-04	-3.14E-03
4131.87100	138.	14	8	7	13	7	6	3.08E-06	10.	2.38E-06	22.7	-6.75E-04	-5.64E-05	-8.12E-04
4133.06681	2.	10	5	6	9	2	7	2.34E-03	2.	2.27E-03	2.9	4.42E-03	3.66E-04	4.29E-02
4133.17200	118.	13	9	5	12	8	4	9.77E-07	8.	9.89E-07	-1.3	-4.93E-04	-9.55E-05	-4.06E-04
4133.18900	-70.	13	9	4	12	8	5	2.96E-06	8.	2.97E-06	-4.	-8.54E-04	-1.66E-04	-7.04E-04
4138.12600	43.	15	7	8	14	6	9	1.30E-06	10.	1.25E-06	3.5	-4.10E-04	-2.40E-05	-6.86E-04
4142.92491	4.	7	5	2	6	2	5	3.10E-04	3.	3.71E-04	-19.7	3.87E-03	2.33E-04	-2.34E-02
4145.42242	3.	11	3	8	10	2	9	2.38E-04	3.	1.97E-04	17.1	-5.67E-03	-3.61E-04	-8.02E-03
4148.87833	0.	10	2	8	9	1	9	1.43E-04	2.	1.11E-04	22.7	-4.15E-03	-2.93E-04	-6.07E-03
4156.09774	5.	10	3	8	9	0	9	4.56E-04	3.	3.53E-04	22.6	7.29E-03	5.00E-04	1.10E-02
4159.85140	-1.	5	5	1	4	0	4	2.66E-06	10.	2.95E-06	-10.8	-2.53E-04	-7.61E-06	1.98E-03
4163.56310	31.	11	5	7	10	2	8	1.59E-04	3.	1.47E-04	7.6	2.51E-03	1.44E-04	9.46E-03
4172.03550	18.	11	4	8	10	1	9	9.22E-05	2.	7.52E-05	18.4	3.38E-03	1.78E-04	5.12E-03
4182.55950	16.	8	4	4	7	1	7	6.83E-05	5.	7.88E-05	-15.4	1.99E-03	8.26E-05	-1.10E-02
4197.10140	3.	12	5	8	11	2	9	1.15E-04	3.	1.03E-04	10.3	3.26E-03	1.38E-04	6.76E-03
4200.92627	-1.	12	3	9	11	2	10	2.82E-05	2.	2.45E-05	13.2	-2.33E-03	-1.02E-04	-2.52E-03
4202.25440	6.	11	2	9	10	1	10	2.00E-04	3.	1.57E-04	21.4	-5.74E-03	-2.86E-04	-6.52E-03
4206.35690	5.	11	3	9	10	0	10	6.98E-05	3.	5.38E-05	22.9	3.30E-03	1.63E-04	3.87E-03
4217.18920	22.	12	4	9	11	1	10	9.70E-05	2.	8.19E-05	15.6	4.11E-03	1.62E-04	4.77E-03
4234.09590	-37.	13	5	9	12	2	10	7.90E-06	5.	8.93E-06	-13.1	1.22E-03	3.81E-05	1.73E-03
4252.37990	27.	12	3	10	11	0	11	4.80E-05	5.	3.70E-05	22.9	3.16E-03	1.32E-04	2.79E-03
4253.99180	-2.	12	2	10	11	1	11	2.86E-05	6.	2.22E-05	22.3	-2.38E-03	-8.68E-05	-2.24E-03
4254.10730	-6.	13	3	10	12	2	11	3.16E-05	2.	2.55E-05	19.4	-2.62E-03	-7.92E-05	-2.35E-03
4261.74630	6.	14	6	9	13	3	10	1.12E-05	4.	1.12E-05	-2.	7.62E-04	1.85E-05	2.57E-03
4273.72220	10.	14	5	10	13	2	11	8.06E-06	3.	6.89E-06	14.5	1.25E-03	2.71E-05	1.35E-03
4304.49110	-3.	13	2	11	12	1	12	3.28E-05	2.	2.53E-05	22.8	-2.74E-03	-7.19E-05	-2.22E-03
4304.62230	-10.	13	3	11	12	0	12	1.06E-05	2.	8.39E-06	20.8	1.58E-03	4.59E-05	1.27E-03
4353.70250	-16.	14	3	12	13	0	13	1.13E-05	10.	8.73E-06	22.8	1.71E-03	3.61E-05	1.21E-03
4354.46150	0.	14	2	12	13	1	13	3.03E-06	8.	2.98E-06	1.6	-9.32E-04	-4.28E-05	-7.52E-04
4401.18860	4.	15	2	13	14	1	14	3.00E-06	10.	2.87E-06	4.5	-9.87E-04	-3.32E-05	-6.72E-04
4414.81990	-5.	10	5	6	9	0	9	3.74E-06	10.	2.86E-06	23.5	-8.99E-04	-5.72E-06	-7.87E-04

Computed frequencies ( $\text{cm}^{-1}$ ) derived from energy levels given in ref. 1 for the (000) state and Table 1 for the upper state. o-c, observed minus computed  $\times 10^5$

(o-c)%, observed minus computed line strengths given in percent. Computed values are derived from constants obtained in this work.

Z(020), Z(100), Z(001) are the contributions of the three states from which the computed strengths are derived:

$$S(\text{calc.}) = [Z(020) + Z(100) + Z(001)]^2$$

**Table 10. Observed and computed line strengths (cm<sup>-2</sup>/atm. at 296K) of the (001)-(000) band of H<sub>2</sub><sup>16</sup>O**

observed frequency	o-c	upper J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(001)	Z(100)	Z(020)
*2992.16050	107.	9	8	2	10	10	1	1.57E-06	10.	1.67E-06	-6.4	7.85E-04	5.07E-04	4.68E-07
3008.27770	3.	10	7	3	11	9	2	2.33E-06	10.	2.16E-06	7.5	1.00E-03	4.88E-04	-2.46E-05
3013.16200	-288.	8	1	8	9	5	5	1.17E-06	10.	1.17E-06	-.2	-8.22E-04	-2.63E-04	1.57E-06
3013.21442	-18.	6	3	3	7	7	0	4.55E-05	2.	3.66E-05	19.6	-5.87E-04	-2.55E-03	-2.91E-03
3027.01400	44.	10	2	8	11	6	5	4.95E-06	2.	4.99E-06	-.8	-1.78E-03	-4.62E-04	5.55E-06
3028.26160	23.	10	1	9	11	5	6	5.60E-06	4.	5.43E-06	3.1	-1.89E-03	-4.43E-04	4.77E-06
*3036.22140	142.	9	7	3	10	9	2	8.47E-06	10.	7.01E-06	17.2	1.78E-03	9.03E-04	-3.59E-05
3040.74150	23.	7	2	6	8	6	3	7.18E-06	3.	6.55E-06	8.8	-1.56E-03	-1.02E-03	2.73E-05
3041.08840	13.	12	1	12	13	3	11	1.32E-06	10.	1.54E-06	-16.5	1.14E-03	9.42E-05	1.56E-06
3054.19290	-90.	13	4	10	14	6	9	8.37E-07	10.	7.60E-07	9.2	7.07E-04	1.68E-04	-3.02E-06
3074.71960	55.	12	2	11	13	4	10	2.10E-06	2.	1.82E-06	13.3	1.24E-03	1.14E-04	-1.16E-06
3077.74530	-19.	7	1	7	8	5	4	9.00E-06	4.	8.56E-06	4.9	-2.20E-03	-7.39E-04	8.99E-06
3080.37350	-19.	6	2	5	7	6	2	3.40E-06	3.	3.49E-06	-2.8	-6.87E-04	-1.22E-03	4.25E-05
3085.35744	-6.	9	6	4	10	8	3	2.33E-05	2.	2.31E-05	.9	3.09E-03	1.75E-03	-3.78E-05
3085.50650	2.	12	5	7	13	7	6	3.37E-06	4.	3.39E-06	-.7	1.02E-03	8.35E-04	-1.82E-05
3085.55892	3.	9	6	3	10	8	2	7.52E-06	2.	7.68E-06	-2.1	1.78E-03	1.01E-03	-2.18E-05
3085.68966	-2.	11	5	7	12	7	6	9.10E-06	3.	9.10E-06	-.1	1.95E-03	1.09E-03	-2.33E-05
3086.13300	-9.	12	1	11	13	3	10	5.41E-06	3.	6.41E-06	-18.5	2.36E-03	1.73E-04	4.59E-07
3101.80320	-7.	11	0	11	12	2	10	5.65E-06	3.	6.38E-06	-12.9	2.35E-03	1.75E-04	8.54E-07
3112.54240	-17.	8	6	3	9	8	2	1.66E-05	6.	1.57E-05	5.6	2.54E-03	1.45E-03	-3.03E-05
3112.58790	6.	8	6	2	9	8	1	4.70E-05	4.	4.70E-05	.1	4.39E-03	2.51E-03	-5.25E-05
3112.67092	3.	10	5	6	11	7	5	1.06E-05	4.	9.93E-06	6.3	2.01E-03	1.16E-03	-2.51E-05
3116.30690	-53.	7	2	5	8	6	2	4.80E-06	4.	5.30E-06	-10.5	-1.88E-03	-4.23E-04	4.15E-06
3120.19200	-3.	10	5	5	11	7	4	3.22E-05	2.	3.18E-05	1.1	3.49E-03	2.20E-03	-4.80E-05
3129.55935	1.	11	4	8	12	6	7	1.93E-05	2.	1.91E-05	1.1	3.11E-03	1.28E-03	-2.64E-05
3136.17150	11.	6	1	6	7	5	3	5.19E-06	3.	5.23E-06	-.8	-1.65E-03	-6.46E-04	1.06E-05
3139.11229	-11.	9	5	5	10	7	4	8.43E-05	2.	8.14E-05	3.4	5.74E-03	3.36E-03	-7.29E-05
*3140.02100	220.	7	6	2	8	8	1	8.60E-05	3.	8.57E-05	.4	5.93E-03	3.39E-03	-6.88E-05
3142.13175	-4.	9	5	4	10	7	3	2.78E-05	3.	2.77E-05	-.3	3.30E-03	2.01E-03	-4.36E-05
3145.89477	10.	11	3	9	12	5	8	2.28E-05	7.	2.24E-05	1.8	4.06E-03	6.81E-04	-1.23E-05
3147.00550	11.	8	1	7	9	5	4	7.24E-05	2.	6.75E-05	6.8	-6.65E-03	-1.59E-03	2.55E-05
3149.33750	15.	11	1	10	12	3	9	7.80E-06	4.	8.28E-06	-6.1	2.69E-03	1.87E-04	-1.30E-06
3157.68655	0.	10	1	10	11	3	9	2.35E-05	3.	2.14E-05	8.9	4.31E-03	3.26E-04	-1.07E-05
3162.08460	7.	10	0	10	11	2	9	7.30E-05	3.	6.67E-05	8.6	7.63E-03	5.42E-04	-2.68E-06
3162.12989	1.	10	4	7	11	6	6	2.55E-05	3.	2.54E-05	.2	3.35E-03	1.73E-03	-3.71E-05
3165.45995	-7.	8	5	4	9	7	3	6.22E-05	2.	6.12E-05	1.5	4.95E-03	2.94E-03	-6.32E-05
3166.45616	-6.	8	5	3	9	7	2	1.88E-04	3.	1.85E-04	1.6	8.57E-03	5.14E-03	-1.11E-04
3177.13130	11.	12	4	8	13	6	7	1.50E-06	10.	1.46E-06	2.8	1.57E-03	-3.75E-04	7.88E-06
3184.52990	-2.	10	2	9	11	4	8	2.76E-05	3.	2.96E-05	-7.1	5.00E-03	4.79E-04	-4.09E-05
3186.35250	-22.	9	2	8	9	6	3	1.50E-06	10.	1.40E-06	6.7	8.26E-04	3.59E-04	-2.15E-06
3188.29715	7.	5	1	5	6	5	2	2.41E-05	6.	2.24E-05	6.9	-2.91E-03	-1.87E-03	3.87E-05
3190.17000	-23.	10	3	8	11	5	7	3.15E-05	2.	3.17E-05	-.5	4.59E-03	1.05E-03	-2.02E-05
3191.97194	-10.	7	5	3	8	7	2	3.37E-04	3.	3.25E-04	3.6	1.14E-02	6.81E-03	-1.46E-04
3192.10360	-6.	9	4	6	10	6	5	2.57E-04	2.	2.47E-04	3.9	9.84E-03	6.01E-03	-1.32E-04
3192.22926	-9.	7	5	2	8	7	1	1.12E-04	3.	1.09E-04	3.1	6.57E-03	3.94E-03	-8.43E-05
3193.05916	0.	7	1	6	8	5	3	4.87E-05	2.	4.66E-05	4.3	-5.49E-03	-1.36E-03	2.40E-05
3200.92520	34.	12	3	9	13	5	8	5.67E-06	4.	5.65E-06	.4	2.36E-03	1.42E-05	1.91E-06
3200.99837	16.	7	0	7	8	4	4	3.78E-05	2.	3.53E-05	6.6	-4.93E-03	-1.03E-03	1.72E-05
3211.21650	-5.	10	4	6	11	6	5	4.70E-06	7.	5.62E-06	-19.6	3.55E-03	-6.06E-03	1.37E-04
3211.55527	2.	9	4	5	10	6	4	1.42E-04	2.	1.40E-04	1.5	5.54E-03	6.43E-03	-1.46E-04
3214.03330	2.	10	1	9	11	3	8	9.60E-05	6.	9.78E-05	-1.8	9.34E-03	5.57E-04	-7.09E-06
3215.32035	3.	9	1	9	10	3	8	2.22E-04	3.	2.16E-04	2.7	1.37E-02	1.03E-03	-8.50E-06
3218.71203	-17.	6	5	2	7	7	1	1.31E-04	3.	1.28E-04	2.4	7.11E-03	4.29E-03	-9.10E-05
3218.75912	12.	6	5	1	7	7	0	3.76E-04	4.	3.82E-04	-1.7	1.23E-02	7.42E-03	-1.58E-04
3220.29233	4.	8	4	5	9	6	4	2.16E-04	2.	2.13E-04	1.5	8.80E-03	5.92E-03	-1.33E-04
3223.45795	5.	9	0	9	10	2	8	7.48E-05	2.	7.36E-05	1.6	8.06E-03	5.28E-04	-5.97E-06
3230.28416	1.	9	3	7	10	5	6	3.84E-04	3.	3.75E-04	2.2	1.45E-02	5.02E-03	-1.00E-04
3230.42005	-17.	8	4	4	9	6	3	8.27E-04	2.	7.99E-04	3.3	1.52E-02	1.34E-02	-3.05E-04
3230.92145	-10.	6	1	5	7	5	2	1.93E-04	2.	1.80E-04	6.6	-1.07E-02	-2.75E-03	5.12E-05
3236.15500	-321.	7	2	6	7	6	1	2.97E-06	4.	2.76E-06	7.0	9.60E-04	7.24E-04	-2.19E-05
3236.39957	-18.	9	2	8	10	4	7	3.33E-04	2.	3.28E-04	1.6	1.62E-02	1.92E-03	-3.52E-05
3242.95123	-40.	11	3	8	12	5	7	8.70E-06	4.	8.58E-06	1.4	3.00E-03	-7.23E-05	4.05E-06
3247.36325	-3.	7	4	4	8	6	3	1.35E-03	3.	1.31E-03	3.3	2.14E-02	1.51E-02	-3.42E-04
3251.50867	-10.	7	4	3	8	6	2	4.92E-04	3.	4.70E-04	4.5	1.23E-02	9.57E-03	-2.19E-04
3261.26650	-12.	5	1	4	6	5	1	4.44E-05	2.	4.18E-05	5.8	-5.17E-03	-1.33E-03	2.53E-05
3264.24009	-1.	6	0	6	7	4	3	3.29E-04	2.	3.05E-04	7.2	-1.44E-02	-3.14E-03	5.21E-05
3266.08620	-3.	8	3	6	9	5	5	5.00E-04	10.	4.55E-04	9.0	1.38E-02	7.71E-03	-1.62E-04
3271.41290	-5.	10	0	10	10	4	7	8.05E-06	5.	7.19E-06	10.6	2.23E-03	4.51E-04	-7.61E-08
3271.91430	-10.	8	1	8	9	3	7	2.44E-04	3.	2.22E-04	8.9	1.39E-02	1.07E-03	-1.67E-05
3272.05174	1.	10	2	8	11	4	7	1.34E-04	2.	1.33E-04	.9	1.13E-02	2.58E-04	-3.45E-06
3273.07730	50.	7	1	7	7	5	2	6.90E-06	3.	6.43E-06	6.8	1.89E-03	6.56E-04	-9.27E-06
3273.87408	-3.	6	4	3	7	6	2	7.06E-04	2.	6.78E-04	3.9	1.53E-02	1.10E-02	-2.52E-04
3275.17513	-10.	6	4	2	7	6	1	2.10E-03	2.	2.08E-03	.9	2.65E-02	1.96E-02	-4.49E-04
3278.84136	-4.	9	1	8	10	3	7	1.25E-04	2.	1.26E-04	-.5	1.07E-02	4.95E-04	-8.33E-06

Table 10 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c) t <sub>s</sub>	Z(001)	Z(100)	Z(020)
*3282.00900	319.	9 7 3	9 9 0	1.27E-06	10.	1.46E-06	-15.1	-7.98E-04	-4.21E-04	9.95E-06
3285.05200	-7.	8 2 7	9 4 6	3.78E-04	3.	3.65E-04	3.5	1.65E-02	2.67E-03	-5.89E-05
3285.72740	-31.	4 1 3	5 5 0	3.87E-05	3.	3.73E-05	3.7	-4.92E-03	-1.21E-03	2.30E-05
3286.16913	14.	8 0 8	9 2 7	7.03E-04	2.	6.85E-04	2.6	2.48E-02	1.44E-03	-2.29E-05
3296.08680	-9.	10 2 8	10 6 5	7.45E-06	10.	7.18E-06	3.6	2.15E-03	5.34E-04	-8.25E-06
3297.57573	-8.	9 3 6	10 5 5	7.15E-05	2.	7.04E-05	1.6	9.71E-03	-1.36E-03	4.38E-05
3298.10676	1.	7 3 5	8 5 4	4.28E-03	3.	4.26E-03	.4	3.51E-02	3.09E-02	-6.86E-04
3300.21398	-10.	5 4 2	6 6 1	2.10E-03	2.	2.08E-03	1.1	2.66E-02	1.94E-02	-4.48E-04
3300.50072	-2.	5 4 1	6 6 0	7.12E-04	2.	6.95E-04	2.3	1.54E-02	1.13E-02	-2.60E-04
3311.75940	-15.	7 2 5	7 6 2	2.60E-06	10.	2.80E-06	-7.8	1.37E-03	3.04E-04	-3.99E-06
3313.44900	-181.	8 2 6	8 6 3	1.39E-05	10.	1.35E-05	3.1	2.96E-03	7.19E-04	-1.14E-05
3315.04288	-1.	8 3 5	9 5 4	3.46E-04	2.	3.30E-04	4.6	2.50E-02	-7.07E-03	2.17E-04
3318.36280	-30.	5 0 5	6 4 2	2.10E-04	2.	1.98E-04	5.9	-1.14E-02	-2.76E-03	5.87E-05
3320.54170	7.	9 0 9	9 4 6	9.50E-06	10.	8.67E-06	8.8	2.47E-03	4.74E-04	-4.43E-06
3323.34140	16.	9 2 7	10 4 6	1.86E-04	2.	1.85E-04	.8	1.35E-02	5.87E-05	4.02E-07
3323.38700	-107.	11 6 6	11 8 3	2.55E-06	10.	2.65E-06	-3.8	-1.05E-03	-5.86E-04	1.23E-05
3325.84100	317.	14 6 8	15 6 9	2.11E-06	15.	2.43E-06	-15.1	1.64E-03	-8.43E-05	2.42E-06
3326.79630	-1.	7 1 7	8 3 6	1.98E-03	2.	1.89E-03	4.4	4.01E-02	3.45E-03	-6.86E-05
3327.58800	-3.	6 3 4	7 5 3	3.45E-03	4.	3.41E-03	1.1	2.62E-02	3.30E-02	-7.75E-04
3328.42400	-14.	15 4 11	16 4 12	6.80E-07	10.	5.26E-07	22.6	-7.10E-04	-1.60E-05	4.09E-07
3329.64418	0.	7 2 6	8 4 5	3.66E-03	2.	3.57E-03	2.6	4.67E-02	1.33E-02	-3.18E-04
3329.83650	27.	9 6 4	9 8 1	9.50E-06	6.	1.00E-05	-5.3	-2.01E-03	-1.17E-03	2.50E-05
3330.03860	27.	9 6 3	9 8 2	3.20E-06	2.	3.33E-06	-4.2	-1.16E-03	-6.78E-04	1.44E-05
3330.77150	-22.	7 3 4	8 5 3	6.60E-05	2.	6.29E-05	4.7	1.92E-02	-1.17E-02	3.56E-04
3341.38362	-3.	8 1 7	9 3 6	1.46E-03	3.	1.43E-03	1.9	3.67E-02	1.13E-03	-2.25E-05
3342.01020	9.	9 1 8	9 5 5	1.40E-05	6.	1.37E-05	2.4	3.05E-03	6.60E-04	-1.19E-05
3344.99320	-23.	14 5 9	15 5 10	5.80E-06	5.	5.33E-06	8.2	2.18E-03	1.35E-04	-4.04E-06
3345.39350	0.	16 2 14	17 2 15	2.36E-06	5.	2.35E-06	.5	1.54E-03	-1.05E-05	5.23E-07
*3346.79760	215.	12 9 3	13 9 4	3.05E-06	10.	2.76E-06	9.5	1.77E-03	-1.11E-04	1.21E-06
3347.38140	2.	15 4 12	16 4 13	3.77E-06	6.	3.99E-06	-5.9	2.02E-03	-2.56E-05	4.17E-06
3347.43000	259.	15 3 12	16 3 13	1.30E-06	10.	1.32E-06	-1.9	-1.15E-03	2.33E-06	1.79E-07
3348.19330	-6.	6 3 3	7 5 2	2.30E-04	4.	2.43E-04	-5.7	3.62E-02	-5.39E-02	2.16E-03
3349.86205	-1.	7 0 7	8 2 6	6.92E-04	2.	6.77E-04	2.2	2.49E-02	1.18E-03	-2.33E-05
3351.62150	-13.	14 4 10	15 4 11	1.06E-05	2.	1.11E-05	-4.9	3.24E-03	9.73E-05	-2.66E-06
3352.64000	3.	13 5 8	14 5 9	6.10E-06	4.	5.99E-06	1.8	2.71E-03	-2.69E-04	7.92E-06
3355.70595	4.	5 3 3	6 5 2	1.87E-02	4.	1.79E-02	4.4	5.18E-02	8.40E-02	-2.06E-03
3356.33880	36.	11 2 10	11 4 7	1.17E-05	5.	1.24E-05	-6.2	-3.07E-03	-4.52E-04	-1.66E-06
*3356.90820	142.	11 10 2	12 10 3	2.40E-06	10.	1.96E-06	18.4	1.51E-03	-1.07E-04	1.42E-07
3359.51985	4.	5 3 2	6 5 1	8.76E-03	4.	8.81E-03	-.5	2.61E-02	6.94E-02	-1.71E-03
3359.79960	-2.	13 6 8	14 6 9	1.40E-05	4.	1.56E-05	-11.6	4.14E-03	-1.88E-04	5.71E-06
3364.28950	-24.	4 0 4	5 4 1	7.40E-04	3.	6.83E-04	7.6	-2.05E-02	-5.81E-03	1.32E-04
3364.82691	-1.	8 2 6	9 4 5	1.85E-03	3.	1.82E-03	1.4	4.34E-02	-6.75E-04	2.09E-05
3365.38220	24.	8 0 8	8 4 5	8.30E-05	3.	8.02E-05	3.4	7.56E-03	1.41E-03	-2.25E-05
*3368.29750	-85.	16 1 15	17 1 16	1.15E-05	6.	1.20E-05	-4.3	3.46E-03	-4.76E-06	3.63E-06
3368.52730	-22.	15 3 13	16 3 14	1.27E-05	4.	1.24E-05	2.6	3.54E-03	-1.93E-05	3.36E-07
3368.81952	-4.	6 2 5	7 4 4	5.18E-03	5.	5.03E-03	2.8	3.86E-02	3.32E-02	-8.24E-04
3369.13610	10.	8 1 7	8 5 4	1.10E-04	10.	8.93E-05	18.8	7.75E-03	1.74E-03	-3.71E-05
3370.90250	-14.	14 3 11	15 3 12	2.12E-05	3.	1.87E-05	11.7	-4.28E-03	-5.16E-05	2.12E-06
*3372.82720	-54.	11 9 3	12 9 4	1.02E-05	5.	9.66E-06	5.3	3.30E-03	-1.96E-04	2.23E-06
3373.87454	-1.	13 5 9	14 5 10	3.94E-05	2.	3.85E-05	2.3	6.43E-03	-2.38E-04	6.81E-06
3373.93210	17.	12 7 5	13 7 6	2.30E-05	3.	2.47E-05	-7.5	5.18E-03	-2.17E-04	1.40E-05
3374.33210	12.	12 7 6	13 7 7	8.41E-06	4.	8.21E-06	2.3	2.98E-03	-1.26E-04	8.25E-06
3375.18700	9.	13 4 9	14 4 10	1.97E-05	3.	2.08E-05	-5.8	4.51E-03	6.21E-05	-1.88E-06
3378.52970	24.	9 1 9	9 3 6	6.10E-05	3.	5.40E-05	11.5	-6.44E-03	-9.35E-04	2.90E-05
3379.12374	-6.	6 1 6	7 3 5	1.75E-03	3.	1.67E-03	4.4	3.67E-02	4.25E-03	-9.77E-05
3380.11520	-4.	10 5 6	10 7 3	7.57E-06	5.	9.41E-06	-24.3	-1.96E-03	-1.14E-03	2.98E-05
3382.47470	40.	12 6 6	13 6 7	8.40E-05	2.	6.98E-05	16.9	8.71E-03	-3.63E-04	1.11E-05
3382.86970	-4.	9 5 5	9 7 2	5.21E-05	2.	5.66E-05	-8.6	-4.75E-03	-2.84E-03	7.31E-05
*3382.90690	-239.	10 10 0	11 10 1	4.16E-06	7.	4.18E-06	-.5	2.19E-03	-1.46E-04	1.23E-07
3383.07556	-5.	4 3 2	5 5 1	6.76E-03	3.	6.63E-03	1.9	2.80E-02	5.49E-02	-1.38E-03
3384.11345	1.	12 5 7	13 5 8	1.22E-04	4.	1.30E-04	-6.7	1.21E-02	-6.93E-04	2.06E-05
3384.38710	2.	4 3 1	5 5 0	2.42E-02	4.	2.36E-02	2.7	4.71E-02	1.09E-01	-2.74E-03
3385.91710	-9.	9 5 4	9 7 3	1.97E-05	2.	1.92E-05	2.7	-2.73E-03	-1.70E-03	4.38E-05
3386.35361	-46.	8 5 3	8 7 2	8.47E-05	3.	8.42E-05	.6	-5.73E-03	-3.54E-03	8.90E-05
3387.84790	0.	7 5 3	7 7 0	6.93E-05	2.	7.38E-05	-6.5	-5.36E-03	-3.32E-03	8.13E-05
3388.10595	6.	7 5 2	7 7 1	2.37E-05	3.	2.46E-05	-4.0	-3.09E-03	-1.92E-03	4.71E-05
3389.32416	12.	7 1 6	7 5 3	4.40E-05	5.	4.39E-05	.3	5.38E-03	1.28E-03	-2.94E-05
3391.04720	0.	15 1 14	16 1 15	1.42E-05	3.	1.46E-05	-2.5	3.82E-03	-5.95E-06	-1.20E-07
3393.00550	-59.	13 4 10	14 4 11	1.10E-04	3.	9.93E-05	9.8	1.01E-02	-1.40E-04	3.77E-06
3393.21580	0.	13 3 10	14 3 11	3.80E-05	5.	3.77E-05	.9	6.13E-03	5.84E-06	-5.38E-07
*3393.68940	0.	16 0 16	17 0 17	5.66E-05	2.	5.32E-05	6.0	7.33E-03	-3.99E-05	1.00E-06
3396.17372	-3.	7 2 5	8 4 4	1.47E-03	3.	1.43E-03	2.6	3.94E-02	-1.58E-03	4.35E-05
3398.14540	-6.	12 5 8	13 5 9	5.50E-05	2.	5.61E-05	-2.0	7.79E-03	-3.10E-04	9.10E-06
3398.81305	2.	7 1 6	8 3 5	1.73E-03	3.	1.69E-03	2.2	4.05E-02	6.41E-04	-1.42E-05
*3398.90280	-20.	10 9 1	11 9 2	3.04E-05	2.	2.70E-05	11.3	5.50E-03	-3.06E-04	3.63E-06
3399.75333	10.	12 4 8	13 4 9	3.04E-04	3.	3.05E-04	-.5	1.71E-02	3.71E-04	-1.12E-05

Table 10 continued

observed frequency	upper o-c	J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	#s	computed strength	(o-c)s	Z(001)	Z(100)	Z(020)
3400.40585	-1.	11 7 4	12 7 5	3.50E-05	5.	3.21E-05	8.2	5.90E-03	-2.44E-04	1.24E-05
3400.56610	-6.	11 7 5	12 7 6	1.06E-04	3.	9.60E-05	9.5	1.02E-02	-4.23E-04	2.16E-05
3402.15828	3.	6 1 5	6 5 2	1.15E-04	3.	1.11E-04	3.8	8.47E-03	2.10E-03	-4.97E-05
3402.69500	-18.	3 0 3	4 4 0	1.21E-04	2.	1.10E-04	8.8	-7.92E-03	-2.64E-03	6.39E-05
3405.02960	-28.	7 0 7	7 4 4	6.98E-05	3.	6.67E-05	4.4	6.88E-03	1.31E-03	-2.74E-05
3407.82610	-15.	5 1 4	5 5 1	1.30E-05	10.	1.29E-05	.7	2.89E-03	7.20E-04	-1.69E-05
3408.74880	-23.	5 2 4	6 4 3	5.80E-05	5.	5.39E-05	7.1	7.75E-02	-7.20E-02	1.05E-03
3410.20450	-19.	11 6 5	12 6 6	9.30E-05	4.	9.22E-05	.8	9.98E-03	-3.94E-04	1.21E-05
3411.10560	-94.	10 2 9	10 4 6	3.12E-05	5.	2.54E-05	18.5	-4.35E-03	-6.10E-04	-8.51E-05
3411.85240	-46.	11 6 6	12 6 7	2.88E-04	4.	2.76E-04	4.2	1.73E-02	-6.99E-04	2.14E-05
3413.06770	32.	6 0 6	7 2 5	5.86E-03	3.	5.92E-03	-1.0	7.44E-02	2.62E-03	-5.86E-05
*3413.56750	48.	10 8 2	11 8 3	1.19E-04	4.	1.19E-04	.0	1.14E-02	-5.46E-04	8.61E-06
3413.84680	-5.	11 5 6	12 5 7	2.02E-04	5.	2.04E-04	-1.0	1.49E-02	-6.39E-04	1.92E-05
3413.85700	-178.	14 2 13	15 2 14	6.26E-05	7.	6.38E-05	-1.9	7.99E-03	-5.25E-06	-2.30E-07
3413.90290	-11.	14 1 13	15 1 14	1.88E-04	2.	1.92E-04	-2.0	1.39E-02	-7.09E-06	-1.13E-06
3413.99131	-6.	13 3 11	14 3 12	2.65E-04	4.	2.60E-04	1.8	1.62E-02	-5.32E-05	1.19E-06
3414.03020	-6.	13 2 11	14 2 12	8.60E-05	4.	8.81E-05	-2.5	9.40E-03	-1.43E-05	6.17E-08
3415.53568	-19.	12 3 9	13 3 10	5.02E-04	2.	5.03E-04	-.2	2.24E-02	7.40E-05	-3.18E-06
3415.66631	4.	12 4 9	13 4 10	1.32E-04	2.	1.38E-04	-4.2	1.20E-02	-2.35E-04	6.63E-06
*3416.15890	-15.	15 1 15	16 1 16	2.35E-04	3.	2.38E-04	-1.2	1.54E-02	-7.33E-06	-4.87E-07
3419.35400	60.	11 4 8	11 6 5	3.25E-05	4.	3.29E-05	-1.3	-4.17E-03	-1.62E-03	5.03E-05
3419.46218	-3.	6 2 4	7 4 3	6.83E-03	4.	7.05E-03	-3.2	9.06E-02	-6.83E-03	1.84E-04
3422.27270	43.	11 3 9	11 5 6	3.86E-05	10.	3.87E-05	-.3	-5.33E-03	-9.19E-04	2.62E-05
3423.11660	5.	11 5 7	12 5 8	6.51E-04	3.	6.65E-04	-2.2	2.68E-02	-1.05E-03	3.16E-05
*3425.01710	-35.	9 9 1	10 9 2	5.23E-05	4.	5.11E-05	2.3	7.53E-03	-3.87E-04	4.80E-06
3426.18660	18.	11 4 7	12 4 8	4.24E-04	6.	4.27E-04	-.8	2.00E-02	7.19E-04	-2.19E-05
3426.79270	3.	10 7 3	11 7 4	3.14E-04	3.	3.20E-04	-2.1	1.86E-02	-7.29E-04	3.08E-05
3426.84840	3.	10 7 4	11 7 5	1.03E-04	3.	1.06E-04	-3.4	1.07E-02	-4.22E-04	1.78E-05
3427.91718	6.	5 1 5	6 3 4	1.44E-02	3.	1.42E-02	1.7	9.46E-02	2.50E-02	-6.31E-04
3435.69360	-6.	9 4 6	9 6 3	2.53E-04	2.	2.51E-04	1.0	-9.89E-03	-6.12E-03	1.85E-04
*3436.29100	69.	13 2 12	14 2 13	1.02E-03	3.	1.03E-03	-.8	3.21E-02	-2.43E-05	4.12E-08
3436.44720	-65.	12 2 10	13 2 11	1.05E-03	7.	1.06E-03	-.7	3.26E-02	-3.77E-05	3.19E-07
3437.47850	5.	10 6 4	11 6 5	9.47E-04	2.	9.49E-04	-.2	3.19E-02	-1.17E-03	3.58E-05
3437.76850	-20.	11 3 8	12 3 9	6.95E-04	2.	6.95E-04	.0	2.62E-02	1.71E-04	-6.01E-06
3437.98840	41.	8 1 8	8 3 5	8.98E-05	2.	8.73E-05	2.8	-8.29E-03	-1.08E-03	2.84E-05
3438.19075	1.	5 2 3	6 4 2	2.92E-03	3.	2.83E-03	3.1	6.07E-02	-7.77E-03	2.09E-04
3438.22060	-1.	10 6 5	11 6 6	3.31E-04	4.	3.17E-04	4.2	1.85E-02	-6.83E-04	2.09E-05
3438.44826	-5.	11 4 8	12 4 9	1.48E-03	2.	1.54E-03	-3.9	4.02E-02	-1.07E-03	3.12E-05
3438.58459	-11.	14 1 14	15 1 15	2.28E-04	4.	2.38E-04	-4.2	1.55E-02	-1.06E-04	5.89E-05
3438.64110	-1.	14 0 14	15 0 15	7.48E-04	2.	7.17E-04	4.1	2.68E-02	-7.75E-06	-1.99E-06
3438.75230	-12.	6 0 6	6 4 3	4.06E-04	2.	3.72E-04	8.4	1.61E-02	3.27E-03	-1.09E-04
*3439.76420	-2.	9 8 2	10 8 3	2.95E-04	3.	2.98E-04	-1.0	1.80E-02	-7.83E-04	1.37E-05
3439.89580	-9.	8 4 5	8 6 2	1.51E-04	3.	1.57E-04	-3.7	-7.47E-03	-5.20E-03	1.53E-04
3439.93765	-8.	4 2 3	5 4 2	8.80E-04	3.	8.52E-04	3.2	5.63E-02	-2.79E-02	7.38E-04
3442.78030	9.	7 4 4	7 6 1	6.42E-04	3.	6.31E-04	1.7	-1.47E-02	-1.08E-02	3.07E-04
3443.10243	-4.	10 5 5	11 5 6	2.15E-03	4.	2.30E-03	-6.9	4.97E-02	-1.81E-03	5.47E-05
3445.00550	-4.	6 4 3	6 6 0	1.70E-04	3.	1.65E-04	2.8	-7.42E-03	-5.59E-03	1.54E-04
3446.31117	-62.	6 4 2	6 6 1	5.52E-04	2.	5.04E-04	8.6	-1.28E-02	-9.96E-03	2.75E-04
3448.40040	0.	6 1 5	7 3 4	1.57E-02	4.	1.55E-02	1.4	1.24E-01	3.16E-04	-6.29E-06
3448.69910	8.	10 5 6	11 5 7	7.95E-04	3.	7.81E-04	1.7	2.90E-02	-1.06E-03	3.22E-05
3450.19170	-8.	8 4 4	8 6 3	5.58E-04	3.	5.47E-04	1.9	-1.20E-02	-1.18E-02	3.54E-04
3453.11370	5.	9 7 2	10 7 3	3.07E-04	3.	2.97E-04	3.2	1.79E-02	-6.47E-04	2.33E-05
3453.12970	0.	9 7 3	10 7 4	9.02E-04	3.	8.92E-04	1.1	3.10E-02	-1.12E-03	4.02E-05
3456.25478	6.	10 4 6	11 4 7	3.70E-03	2.	3.86E-03	-4.3	5.81E-02	4.10E-03	-1.27E-04
3457.50030	-9.	9 2 8	9 4 5	3.80E-04	4.	3.69E-04	2.8	-1.69E-02	-2.41E-03	6.94E-05
*3458.54510	-82.	12 1 11	13 1 12	3.78E-03	2.	3.76E-03	-.7	6.13E-02	-4.04E-05	0.00E+00
3458.59614	6.	11 2 9	12 2 10	1.25E-03	2.	1.30E-03	-3.9	3.61E-02	-1.35E-05	-1.78E-07
3458.76060	-7.	11 3 9	12 3 10	3.56E-03	3.	3.70E-03	-4.1	6.12E-02	-3.83E-04	1.05E-05
3460.40922	3.	10 3 7	11 3 8	7.55E-03	2.	7.88E-03	-4.4	8.79E-02	8.72E-04	-2.89E-05
*3460.59530	14.	13 1 13	14 1 14	3.50E-03	2.	3.52E-03	-.5	5.93E-02	-1.11E-05	-1.00E-06
3461.69790	-3.	10 4 7	11 4 8	1.70E-03	4.	1.71E-03	-.4	4.27E-02	-1.39E-03	4.16E-05
3464.38142	-3.	9 6 3	10 6 4	9.38E-04	3.	9.37E-04	.1	3.16E-02	-1.05E-03	3.18E-05
3464.66833	0.	9 6 4	10 6 5	2.73E-03	3.	2.82E-03	-3.3	5.49E-02	-1.82E-03	5.53E-05
*3465.95030	0.	8 8 0	9 8 1	5.09E-04	3.	5.02E-04	1.3	2.33E-02	-9.04E-04	1.82E-05
3466.02920	34.	5 0 5	5 4 2	1.60E-04	4.	1.51E-04	5.4	1.00E-02	2.31E-03	-5.97E-05
3468.55815	6.	3 2 2	4 4 1	3.10E-03	3.	3.01E-03	2.9	9.03E-02	-3.65E-02	9.97E-04
3469.02860	10.	14 0 14	14 2 13	2.70E-05	5.	3.07E-05	-13.8	-5.57E-03	1.30E-05	1.11E-05
3470.56410	2.	9 4 5	10 4 6	3.40E-03	4.	3.48E-03	-2.3	6.30E-02	-4.17E-03	1.28E-04
3471.70550	-9.	9 3 7	9 5 4	6.14E-04	2.	5.76E-04	6.2	-1.81E-02	-6.08E-03	2.22E-04
3471.79498	-8.	9 5 4	10 5 5	2.37E-03	3.	2.40E-03	-1.4	5.06E-02	-1.62E-03	4.95E-05
3473.29340	3.	4 1 4	5 3 3	1.63E-03	2.	1.56E-03	4.4	6.85E-02	-2.98E-02	8.03E-04
3473.36978	-1.	5 0 5	6 2 4	5.71E-03	3.	5.66E-03	.8	7.37E-02	1.62E-03	-4.22E-05
3474.73880	-5.	9 5 5	10 5 6	6.90E-03	3.	7.25E-03	-5.0	8.79E-02	-2.88E-03	8.80E-05
3474.78360	-4.	3 2 1	4 4 0	1.58E-03	2.	1.49E-03	5.5	5.36E-02	-1.54E-02	4.24E-04
*3479.37080	-27.	8 7 1	9 7 2	2.80E-03	10.	2.64E-03	5.6	5.31E-02	-1.73E-03	5.30E-05
3480.39544	-7.	10 2 8	11 2 9	1.28E-02	2.	1.31E-02	-2.5	1.14E-01	1.06E-04	-4.39E-06

Table 10 continued

observed frequency	upper o-c	J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	computed ts	strength	(o-c)t	z(001)	z(100)	z(020)
*3480.59400	-151.	11 2 10	12 2 11	1.34E-02	10.	1.25E-02	6.9	1.12E-01	-1.17E-04	2.95E-06
3480.88642	-6.	10 3 8	11 3 9	3.95E-03	3.	3.99E-03	-1.1	6.38E-02	-6.24E-04	1.79E-05
*3482.48170	-16.	12 0 12	13 0 13	1.27E-02	4.	1.18E-02	7.1	1.09E-01	-2.21E-05	-5.86E-07
3484.13180	6.	9 3 6	10 3 7	8.80E-03	4.	8.90E-03	-1.1	9.31E-02	1.24E-03	-4.06E-05
3485.15550	2.	8 3 6	8 5 3	5.39E-04	3.	5.22E-04	3.2	-1.48E-02	-8.35E-03	3.15E-04
3485.74075	6.	9 4 6	10 4 7	1.49E-02	2.	1.54E-02	-3.4	1.28E-01	-4.47E-03	1.37E-04
3486.52300	-21.	4 0 4	4 4 1	2.67E-04	2.	2.59E-04	3.0	1.27E-02	3.46E-03	-9.65E-05
3488.35040	4.	5 1 4	6 3 3	1.20E-02	6.	1.16E-02	3.4	1.09E-01	-9.71E-04	2.74E-05
3490.55569	4.	7 1 7	7 3 4	1.26E-03	2.	1.17E-03	7.1	-3.04E-02	-3.89E-03	1.09E-04
3491.00980	-14.	8 6 2	9 6 3	7.03E-03	10.	7.03E-03	.1	8.63E-02	-2.51E-03	7.52E-05
3491.10201	-7.	8 6 3	9 6 4	2.24E-03	3.	2.34E-03	-4.6	4.98E-02	-1.45E-03	4.35E-05
3491.73720	0.	13 0 13	13 2 12	4.35E-05	2.	4.13E-05	5.1	-6.45E-03	1.86E-05	5.63E-06
3491.80020	-7.	13 1 13	13 1 12	1.33E-04	5.	1.24E-04	6.7	1.12E-02	-3.22E-05	-8.29E-06
3493.43806	0.	7 3 5	7 5 2	3.28E-03	2.	3.29E-03	-.4	-2.96E-02	-2.88E-02	1.06E-03
3493.68800	-30.	14 1 13	14 3 12	1.66E-05	6.	1.63E-05	2.1	-4.06E-03	2.02E-05	9.99E-06
3494.16159	21.	8 2 7	8 4 4	5.42E-04	2.	4.96E-04	8.5	-1.90E-02	-3.36E-03	9.44E-05
3494.26000	1.	14 2 13	14 2 12	6.25E-06	10.	6.18E-06	1.1	2.50E-03	-1.17E-05	-2.30E-06
3498.60202	-2.	6 3 4	6 5 1	1.67E-03	2.	1.64E-03	1.8	-1.62E-02	-2.51E-02	8.57E-04
3499.74675	-2.	8 5 3	9 5 4	1.81E-02	10.	1.93E-02	-6.7	1.43E-01	-3.97E-03	1.22E-04
3501.06252	-1.	8 5 4	9 5 5	6.33E-03	2.	6.43E-03	-1.6	8.25E-02	-2.33E-03	7.17E-05
3501.56790	1.	8 4 4	9 4 5	3.74E-02	2.	3.79E-02	-1.4	2.02E-01	-7.99E-03	2.49E-04
3501.82565	-2.	9 2 7	10 2 8	1.34E-02	5.	1.35E-02	-.5	1.16E-01	3.16E-04	-1.03E-05
3502.22836	-1.	5 3 3	5 5 0	4.42E-03	3.	4.27E-03	3.4	-2.12E-02	-4.55E-02	1.37E-03
3502.40920	44.	10 1 9	11 1 10	2.95E-02	4.	2.85E-02	3.5	1.69E-01	-9.14E-05	1.47E-06
3502.42400	42.	10 2 9	11 2 10	9.75E-03	4.	9.40E-03	3.5	9.71E-02	-1.40E-04	8.72E-06
3502.87468	-3.	9 3 7	10 3 8	3.38E-02	3.	3.42E-02	-1.2	1.88E-01	-3.02E-03	8.99E-05
*3504.16450	-80.	11 1 11	12 1 12	3.80E-02	3.	3.59E-02	5.6	1.89E-01	-4.32E-05	3.66E-07
*3505.55510	-4.	7 7 1	8 7 2	3.90E-03	2.	3.96E-03	-1.5	6.47E-02	-1.85E-03	4.66E-05
3506.07942	-2.	5 3 2	5 5 1	1.97E-03	3.	1.89E-03	3.9	-7.11E-03	-3.75E-02	1.14E-03
3509.42112	-3.	8 3 5	9 3 6	8.04E-02	3.	7.89E-02	1.8	2.76E-01	4.88E-03	-1.60E-04
3510.65301	11.	8 4 5	9 4 6	1.34E-02	3.	1.40E-02	-4.2	1.22E-01	-4.00E-03	1.24E-04
3513.07080	-32.	3 1 3	4 3 2	1.65E-02	10.	1.55E-02	6.3	1.42E-01	-1.83E-02	5.22E-04
3514.40081	0.	12 0 12	12 2 11	4.28E-04	2.	4.41E-04	-3.0	-2.11E-02	7.33E-05	6.28E-06
3514.53642	-4.	12 1 12	12 1 11	1.45E-04	2.	1.47E-04	-1.3	1.22E-02	-4.29E-05	-2.75E-06
3516.12058	-25.	13 1 12	13 3 11	2.40E-05	2.	2.62E-05	-9.1	-5.15E-03	2.81E-05	2.64E-06
3517.31950	-9.	13 2 12	13 2 11	7.75E-05	4.	7.84E-05	-1.2	8.91E-03	-5.27E-05	-1.11E-06
3517.42690	-22.	7 6 1	8 6 2	4.68E-03	3.	4.65E-03	.7	6.99E-02	-1.73E-03	5.09E-05
3517.45020	0.	7 6 2	8 6 3	1.40E-02	3.	1.39E-02	.7	1.21E-01	-3.00E-03	8.82E-05
3517.67500	-58.	14 2 12	14 4 11	8.11E-06	4.	7.44E-06	8.3	-2.70E-03	-2.82E-05	-7.06E-07
3518.99193	-1.	4 1 3	5 3 2	4.95E-02	4.	5.01E-02	-1.2	2.28E-01	-4.59E-03	1.32E-04
3521.11570	9.	7 2 6	7 4 3	4.70E-03	10.	4.67E-03	.6	-5.31E-02	-1.57E-02	4.64E-04
3523.14073	-2.	8 2 6	9 2 7	1.10E-01	4.	1.14E-01	-3.7	3.36E-01	1.57E-03	-4.96E-05
3523.97280	8.	9 1 8	10 1 9	2.45E-02	5.	2.61E-02	-6.5	1.62E-01	-5.16E-05	8.37E-07
3524.10173	5.	9 2 8	10 2 9	7.10E-02	10.	7.72E-02	-8.7	2.78E-01	-5.86E-04	1.64E-05
3524.83572	-4.	8 3 6	9 3 7	2.97E-02	2.	2.80E-02	5.7	1.72E-01	-4.51E-03	1.38E-04
*3525.63880	-15.	10 0 10	11 0 11	1.06E-01	5.	9.95E-02	6.2	3.15E-01	-7.01E-05	8.81E-07
3527.00810	-41.	7 5 2	8 5 3	1.41E-02	5.	1.44E-02	-2.3	1.23E-01	-2.86E-03	8.84E-05
3527.49531	-4.	7 5 3	8 5 4	4.49E-02	3.	4.32E-02	3.9	2.13E-01	-4.99E-03	1.55E-04
3528.12027	4.	4 0 4	5 2 3	4.75E-02	2.	4.62E-02	2.8	2.13E-01	2.10E-03	-6.13E-05
3531.37515	6.	7 4 3	8 4 4	3.24E-02	2.	3.26E-02	-.7	1.86E-01	-5.27E-03	1.67E-04
3534.26927	14.	6 1 6	6 3 3	1.55E-03	2.	1.47E-03	5.0	-3.35E-02	-5.07E-03	1.54E-04
3536.26616	-2.	7 4 4	8 4 5	9.60E-02	6.	1.00E-01	-4.6	3.26E-01	-9.00E-03	2.86E-04
3536.52560	1.	7 3 4	8 3 5	6.60E-02	5.	6.52E-02	1.2	2.49E-01	6.23E-03	-2.09E-04
3536.87465	4.	11 0 11	11 2 10	4.76E-04	2.	4.78E-04	-.4	-2.20E-02	9.24E-05	1.55E-06
3537.16550	36.	11 1 11	11 1 10	1.50E-03	7.	1.44E-03	4.2	3.81E-02	-1.64E-04	2.48E-07
3538.34971	11.	12 1 11	12 3 10	2.92E-04	2.	3.01E-04	-3.0	-1.75E-02	1.17E-04	1.23E-06
3538.71640	23.	13 2 11	13 4 10	1.20E-05	3.	1.36E-05	-13.7	-3.73E-03	3.33E-05	4.40E-07
3538.78321	-6.	6 2 5	6 4 2	4.76E-03	2.	4.65E-03	2.2	-3.51E-02	-3.42E-02	1.05E-03
3540.70830	8.	12 2 11	12 2 10	9.46E-05	2.	1.00E-04	-6.2	1.01E-02	-7.80E-05	1.99E-06
3543.01971	13.	3 1 2	4 3 1	1.42E-02	5.	1.50E-02	-5.7	1.26E-01	-4.09E-03	1.21E-04
*3543.65900	30.	6 6 0	7 6 1	2.30E-02	5.	2.49E-02	-.8.2	1.61E-01	-3.27E-03	9.25E-05
3545.03745	-15.	7 2 5	8 2 6	9.40E-02	5.	9.69E-02	-.3.1	3.10E-01	1.90E-03	-6.02E-05
3545.22318	1.	8 1 7	9 1 8	1.73E-01	6.	1.96E-01	-13.3	4.43E-01	5.83E-05	-2.77E-06
3545.55151	0.	8 2 7	9 2 8	6.21E-02	4.	6.33E-02	-2.0	2.53E-01	-9.28E-04	2.83E-05
*3546.89700	-169.	9 1 9	10 1 10	2.70E-01	10.	2.50E-01	7.5	5.00E-01	-1.42E-04	2.70E-06
3547.15753	-4.	7 3 5	8 3 6	1.85E-01	5.	1.75E-01	5.2	4.35E-01	-1.66E-02	5.25E-04
3547.30041	-4.	9 3 6	9 5 5	2.20E-04	4.	2.37E-04	-.7.6	-1.73E-02	2.00E-03	-3.14E-05
3548.35729	0.	2 1 2	3 3 1	4.82E-03	2.	4.62E-03	4.2	7.40E-02	-6.18E-03	1.85E-04
3553.73810	34.	6 5 1	7 5 2	8.00E-02	5.	7.70E-02	3.8	2.82E-01	-5.23E-03	1.62E-04
3553.87967	-4.	6 5 2	7 5 3	2.51E-02	2.	2.57E-02	-2.2	1.63E-01	-3.03E-03	9.36E-05
3554.88670	32.	12 3 9	12 5 8	5.60E-05	5.	6.25E-05	-11.6	-8.11E-03	2.06E-04	-1.83E-06
3554.91372	-6.	10 3 7	10 5 6	3.92E-04	2.	4.07E-04	-.3.9	-2.16E-02	1.41E-03	-2.27E-05
3557.85217	39.	11 3 8	11 5 7	6.03E-05	5.	6.01E-05	-.3	-8.07E-03	3.18E-04	-4.80E-06
3558.38110	-8.	12 2 10	12 4 9	1.57E-04	3.	1.63E-04	-4.1	-1.29E-02	1.44E-04	-3.35E-06
3559.11510	23.	10 0 10	10 2 9	4.32E-03	4.	4.26E-03	1.5	-6.56E-02	3.32E-04	-4.18E-06
3559.73710	6.	10 1 10	10 1 9	1.37E-03	2.	1.43E-03	-4.1	3.79E-02	-2.00E-04	1.43E-05

Table 10 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(001)	Z(100)	Z(020)
3560.13247	-16.	6 4 2	7 4 3	2.01E-01	2.	2.01E-01	-.2	4.58E-01	-9.70E-03	3.13E-04
3561.91794	-5.	4 2 3	4 4 0	6.84E-04	2.	6.47E-04	5.5	-4.15E-02	1.66E-02	-5.38E-04
3562.32008	10.	6 4 3	7 4 4	7.02E-02	3.	6.74E-02	4.0	2.65E-01	-5.67E-03	1.83E-04
3563.96676	0.	2 1 1	3 3 0	2.41E-02	2.	2.40E-02	.5	1.62E-01	-7.27E-03	2.22E-04
3565.67221	0.	6 3 3	7 3 4	3.20E-01	4.	3.35E-01	-4.6	5.57E-01	2.25E-02	-8.12E-04
3566.08033	-4.	7 1 6	8 1 7	1.43E-01	4.	1.48E-01	-3.7	3.85E-01	3.45E-04	-1.10E-05
3566.75240	-10.	7 2 6	8 2 7	4.04E-01	4.	4.13E-01	-2.2	6.47E-01	-5.05E-03	1.61E-04
3567.92200	-15.	8 0 8	9 0 9	4.27E-01	4.	4.26E-01	.3	6.53E-01	-1.47E-04	3.67E-06
3567.93500	-67.	8 1 8	9 1 9	1.43E-01	4.	1.42E-01	.8	3.77E-01	-1.36E-04	3.59E-06
3568.08380	4.	5 1 5	5 3 2	1.44E-02	6.	1.42E-02	1.5	-9.14E-02	-2.87E-02	9.26E-04
3568.28936	-13.	6 2 4	7 2 5	6.67E-01	3.	6.57E-01	1.6	8.05E-01	5.45E-03	-1.77E-04
3570.54048	3.	6 3 4	7 3 5	1.06E-01	2.	1.09E-01	-2.9	3.45E-01	-1.52E-02	4.99E-04
3575.04985	4.	3 0 3	4 2 2	3.45E-02	3.	3.40E-02	1.6	1.84E-01	1.76E-04	-6.45E-06
3575.77360	-16.	11 2 9	11 4 8	2.00E-04	3.	1.92E-04	4.1	-1.40E-02	1.91E-04	-6.67E-06
3578.01480	-2.	4 2 2	4 4 1	4.31E-03	2.	4.18E-03	3.1	-7.72E-02	1.30E-02	-4.31E-04
3580.06480	-31.	5 5 0	6 5 1	3.20E-02	2.	3.09E-02	3.5	1.78E-01	-2.43E-03	7.35E-05
3580.09440	-12.	5 5 1	6 5 2	9.42E-02	3.	9.26E-02	1.7	3.08E-01	-4.21E-03	1.27E-04
3581.04100	-7.	9 0 9	9 2 8	3.80E-03	2.	3.83E-03	-.9	-6.23E-02	3.75E-04	-1.01E-05
3581.12846	3.	10 1 9	10 3 8	3.33E-03	3.	3.32E-03	.4	-5.81E-02	5.65E-04	-1.82E-05
3582.36900	2.	9 1 9	9 1 8	1.15E-02	10.	1.15E-02	-.4	1.08E-01	-7.36E-04	1.66E-05
3585.85649	-1.	5 2 3	5 4 2	3.20E-03	2.	3.09E-03	3.5	-6.20E-02	6.69E-03	-2.23E-04
3586.54285	-10.	6 1 5	7 1 6	9.00E-01	3.	9.16E-01	-1.8	9.56E-01	1.82E-03	-5.75E-05
3586.60354	-1.	5 3 2	6 3 3	1.18E-01	3.	1.25E-01	-6.0	3.77E-01	-2.40E-02	8.11E-04
3586.95527	3.	6 2 5	7 2 6	2.18E-01	4.	2.19E-01	-.6	4.81E-01	-1.27E-02	4.18E-04
3587.77888	-1.	5 4 1	6 4 2	1.10E-01	8.	1.09E-01	1.1	3.35E-01	-4.92E-03	1.60E-04
3588.54721	-3.	5 4 2	6 4 3	3.23E-01	4.	3.26E-01	-1.1	5.80E-01	-8.62E-03	2.81E-04
3588.71011	0.	7 0 7	8 0 8	2.83E-01	3.	2.92E-01	-3.1	5.40E-01	-1.10E-04	3.16E-06
3588.74955	-3.	7 1 7	8 1 8	8.47E-01	3.	8.73E-01	-3.1	9.35E-01	-4.97E-04	1.51E-05
3589.59105	8.	10 2 9	10 2 8	1.12E-03	2.	1.14E-03	-2.0	3.42E-02	-4.72E-04	6.32E-05
3589.72380	-13.	10 2 8	10 4 7	1.72E-03	4.	1.74E-03	-1.3	-4.24E-02	7.02E-04	-2.67E-05
3593.19730	-13.	5 2 3	6 2 4	4.11E-01	3.	4.26E-01	-3.7	6.49E-01	4.23E-03	-1.42E-04
3593.41880	-15.	4 1 4	4 3 1	1.80E-03	4.	1.77E-03	1.5	-7.01E-02	2.89E-02	-9.74E-04
3593.97453	0.	6 2 4	6 4 3	1.23E-02	3.	1.22E-02	.5	-1.18E-01	7.94E-03	-2.67E-04
3595.32593	-3.	5 3 3	6 3 4	5.50E-01	2.	5.75E-01	-4.5	7.87E-01	-3.04E-02	1.03E-03
3598.90941	1.	9 2 7	9 4 6	1.43E-03	2.	1.43E-03	-.1	-3.86E-02	8.06E-04	-3.02E-05
3600.20538	-4.	7 2 5	7 4 4	3.96E-03	2.	3.88E-03	2.0	-6.50E-02	2.75E-03	-9.44E-05
3600.75960	-3.	9 1 8	9 3 7	3.13E-03	4.	3.12E-03	.3	-5.65E-02	6.33E-04	-2.43E-05
3602.35380	8.	8 2 6	8 4 5	8.25E-03	2.	8.18E-03	.8	-9.30E-02	2.64E-03	-9.43E-05
3602.49027	-1.	8 0 8	8 2 7	2.77E-02	4.	2.83E-02	-2.2	-1.69E-01	1.20E-03	-4.18E-05
3605.25540	7.	8 1 8	8 1 7	9.50E-03	10.	9.53E-03	-.3	9.85E-02	-8.89E-04	3.09E-05
3606.99330	-19.	5 1 4	6 1 5	5.60E-01	3.	5.67E-01	-1.3	7.51E-01	2.07E-03	-6.71E-05
3609.23363	-3.	6 0 6	7 0 7	1.59E+00	2.	1.62E+00	-.9	1.27E+00	-1.71E-04	5.31E-06
3609.33879	-6.	6 1 6	7 1 7	5.21E-01	2.	5.35E-01	-2.7	7.32E-01	-7.20E-04	2.36E-05
3610.16944	1.	3 1 3	3 3 0	8.90E-03	4.	8.86E-03	.5	-1.06E-01	1.26E-02	-4.35E-04
3612.56227	-16.	5 2 4	6 2 5	1.33E+00	2.	1.34E+00	-.9	1.14E+00	2.33E-02	-8.07E-04
3613.05660	-2.	2 0 2	3 2 1	1.41E-01	3.	1.39E-01	1.5	3.74E-01	-1.49E-03	4.76E-05
3614.50965	-16.	4 4 0	5 4 1	3.66E-01	4.	3.57E-01	2.4	6.02E-01	-5.07E-03	1.60E-04
3614.70244	0.	4 4 1	5 4 2	1.17E-01	3.	1.19E-01	-1.7	3.48E-01	-2.94E-03	9.31E-05
3615.81432	10.	9 2 8	9 2 7	1.01E-02	3.	9.97E-03	1.2	1.02E-01	-2.20E-03	9.18E-05
3617.65130	-1.	4 3 1	5 3 2	8.46E-01	4.	8.49E-01	-.3	9.46E-01	-2.56E-02	8.99E-04
3618.18680	-2.	8 1 7	8 3 6	2.33E-02	3.	2.31E-02	.7	-1.54E-01	1.93E-03	-7.91E-05
3619.61182	-2.	4 2 2	5 2 3	2.05E+00	3.	2.07E+00	-1.0	1.43E+00	7.61E-03	-2.68E-04
3621.18047	-6.	4 3 2	5 3 3	3.03E-01	3.	3.02E-01	.5	5.62E-01	-1.35E-02	4.75E-04
3623.16565	9.	7 0 7	7 2 6	2.05E-02	3.	2.10E-02	-2.3	-1.46E-01	1.21E-03	-4.69E-05
3628.34630	-17.	4 1 3	5 1 4	2.75E+00	2.	2.80E+00	-1.7	1.67E+00	4.93E-03	-1.65E-04
3628.69824	4.	7 1 7	7 1 6	6.32E-02	3.	6.43E-02	-1.8	2.57E-01	-3.39E-03	1.33E-04
3629.44650	-19.	5 0 5	6 0 6	8.69E-01	4.	8.92E-01	-2.7	9.44E-01	3.48E-05	0.00E+00
3629.64340	-6.	5 1 5	6 1 6	2.53E+00	2.	2.60E+00	-3.0	1.62E+00	-4.82E-03	1.66E-04
3632.27580	-66.	7 1 6	7 3 5	1.66E-02	2.	1.61E-02	4.3	-1.28E-01	1.73E-03	-7.20E-05
3633.84343	1.	4 2 3	5 2 4	7.11E-01	2.	7.32E-01	-3.0	8.49E-01	6.72E-03	-2.45E-04
*3635.97370	-2.	11 11 1	11 11 0	9.17E-06	2.	9.09E-06	.9	2.99E-03	2.24E-05	9.19E-07
3636.21000	11.	12 4 9	12 4 8	4.11E-05	3.	4.07E-05	.9	6.63E-03	-2.71E-04	1.86E-05
3637.80570	5.	10 3 8	10 3 7	8.64E-04	3.	8.18E-04	5.3	2.98E-02	-1.28E-03	6.38E-05
3641.64288	13.	3 1 2	3 3 1	9.23E-03	2.	9.32E-03	-1.0	-9.93E-02	2.85E-03	-1.02E-04
3641.77836	6.	6 1 5	6 3 4	7.83E-02	2.	7.80E-02	.4	-2.83E-01	4.12E-03	-1.66E-04
3642.56579	-3.	6 0 6	6 2 5	1.29E-01	2.	1.25E-01	3.3	-3.56E-01	3.32E-03	-1.34E-04
3643.02526	3.	8 2 7	8 2 6	8.84E-03	3.	8.95E-03	-1.2	9.78E-02	-3.39E-03	1.53E-04
3643.32933	17.	1 0 1	2 2 0	2.71E-02	3.	2.77E-02	-2.2	1.67E-01	-9.21E-04	3.13E-05
3645.28710	-1.	4 1 3	4 3 2	6.65E-02	2.	6.77E-02	-1.8	-2.66E-01	5.59E-03	-2.05E-04
3645.60860	-12.	8 4 4	7 6 1	3.22E-05	2.	3.44E-05	-6.7	-2.84E-03	-3.13E-03	1.06E-04
3645.93118	1.	5 1 4	5 3 3	3.00E-02	3.	3.00E-02	-.1	-1.76E-01	2.92E-03	-1.12E-04
3646.46362	-3.	3 3 0	4 3 1	3.42E-01	3.	3.51E-01	-2.6	5.95E-01	-2.62E-03	8.61E-05
3647.13830	3.	3 2 1	4 2 2	8.74E-01	3.	8.88E-01	-.6	9.40E-01	2.53E-03	-9.70E-05
3647.55293	-8.	3 3 1	4 3 2	1.07E+00	5.	1.05E+00	1.8	1.03E+00	-4.74E-03	1.57E-04
3649.28298	-2.	4 0 4	5 0 5	3.95E+00	2.	3.94E+00	.2	1.98E+00	7.10E-04	-2.27E-05
3650.63601	1.	4 1 4	5 1 5	1.27E+00	3.	1.25E+00	1.4	1.11E+00	5.71E-03	-2.07E-04

Table 10 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>b</sub>	computed strength	(o-c)t <sub>b</sub>	Z(001)	Z(100)	Z(020)
3651.36505	-1.	3 1 2	4 1 3	1.33E+00	2.	1.32E+00	1.1	1.14E+00	2.72E-03	-9.53E-05
3652.91230	4.	6 1 6	6 1 5	4.72E-02	5.	4.38E-02	7.2	2.14E-01	-4.87E-03	2.03E-04
*3653.84800	0.	10 10 0	10 10 1	1.15E-04	2.	1.14E-04	.5	1.06E-02	6.69E-05	7.84E-07
3655.33250	-13.	9 1 9	8 3 6	1.13E-04	2.	1.21E-04	-7.1	-1.06E-02	-4.27E-04	1.02E-05
3655.46600	78.	9 4 6	8 6 3	2.50E-05	6.	2.43E-05	2.7	-3.21E-03	-1.79E-03	7.06E-05
3656.30351	1.	3 2 2	4 2 3	2.69E+00	3.	2.72E+00	-1.2	1.65E+00	4.00E-03	-1.62E-04
3659.93455	0.	5 0 5	5 2 4	7.00E-02	3.	7.15E-02	-2.2	-2.70E-01	2.65E-03	-1.13E-04
*3661.88920	27.	12 9 3	12 9 4	1.51E-05	4.	1.70E-05	-12.3	4.05E-03	6.81E-05	-2.50E-07
3662.78511	0.	13 5 9	13 5 8	2.07E-05	2.	2.17E-05	-4.8	4.75E-03	-1.14E-04	1.71E-05
3664.39162	5.	11 4 8	11 4 7	5.55E-04	2.	5.65E-04	-1.8	2.49E-02	-1.17E-03	8.22E-05
3664.67477	0.	7 3 5	6 5 2	2.84E-04	3.	2.82E-04	.6	-8.63E-03	-8.13E-03	-4.97E-05
*3665.09720	39.	11 9 3	11 9 2	7.93E-05	2.	7.65E-05	3.5	8.64E-03	1.06E-04	-7.83E-07
3665.95254	2.	6 3 3	5 5 0	3.95E-04	2.	4.20E-04	-6.2	-1.57E-02	8.15E-03	-1.29E-02
3666.08389	4.	9 3 7	9 3 6	8.15E-03	2.	8.26E-03	-1.3	9.65E-02	-5.97E-03	3.05E-04
*3668.06880	3.	10 9 1	10 9 2	3.08E-04	2.	3.11E-04	-1.0	1.75E-02	1.49E-04	-1.44E-06
3668.77652	-6.	3 0 3	4 0 4	1.68E+00	2.	1.70E+00	-1.3	1.30E+00	9.79E-04	-3.38E-05
3669.94288	-1.	7 2 6	7 2 5	6.33E-02	2.	6.55E-02	-3.4	2.73E-01	-1.75E-02	8.08E-04
3670.74961	-1.	3 1 3	4 1 4	4.84E+00	2.	4.85E+00	-.2	2.20E+00	2.69E-03	-1.04E-04
3671.45150	8.	8 1 8	7 3 5	1.24E-04	2.	1.28E-04	-3.0	-1.08E-02	-5.16E-04	2.97E-05
3672.09530	9.	13 8 6	13 8 5	5.40E-06	10.	6.05E-06	-12.1	2.42E-03	4.74E-05	-3.81E-06
3674.26857	-5.	4 0 4	4 2 3	3.00E-01	3.	2.99E-01	.4	-5.51E-01	5.07E-03	-2.17E-04
3674.95780	0.	2 2 0	3 2 1	2.30E+00	2.	2.31E+00	-.6	1.52E+00	-2.27E-03	7.74E-05
3676.01950	-3.	2 1 1	3 1 2	4.49E+00	2.	4.51E+00	-.5	2.12E+00	2.74E-03	-1.01E-04
3677.43838	9.	5 1 5	5 1 4	2.37E-01	2.	2.35E-01	.9	5.15E-01	-3.16E-02	1.35E-03
3678.62680	-2.	11 8 4	11 8 3	1.34E-04	2.	1.38E-04	-2.9	1.16E-02	1.37E-04	-1.24E-05
3678.63670	-56.	11 8 3	11 8 4	4.48E-05	2.	4.61E-05	-2.8	6.72E-03	7.90E-05	-7.20E-06
3679.43622	-11.	2 2 1	3 2 2	7.81E-01	2.	7.76E-01	.6	8.83E-01	-1.79E-03	6.25E-05
3681.42043	7.	8 3 6	7 5 3	6.88E-05	2.	7.23E-05	-5.0	-5.92E-03	-2.58E-03	0.00E+00
*3681.54830	-7.	10 8 2	10 8 3	7.34E-04	2.	7.49E-04	-2.0	2.71E-02	2.38E-04	-2.10E-05
3683.93374	19.	7 1 7	6 3 4	1.03E-03	2.	1.01E-03	2.0	-3.01E-02	-1.77E-03	1.07E-04
3683.99024	0.	12 5 8	12 5 7	3.93E-05	4.	4.10E-05	-4.2	6.51E-03	-1.32E-04	2.08E-05
*3684.24310	15.	9 8 2	9 8 1	2.73E-03	2.	2.74E-03	-.4	5.21E-02	3.32E-04	-2.32E-05
3684.52780	-12.	3 0 3	3 2 2	9.90E-02	2.	9.73E-02	1.7	-3.14E-01	2.17E-03	-9.12E-05
3686.44890	-13.	6 2 5	5 4 2	5.06E-04	2.	4.99E-04	1.4	-1.27E-02	-1.02E-02	6.01E-04
3688.45126	-7.	2 0 2	3 0 3	5.65E+00	2.	5.75E+00	-1.8	2.40E+00	2.12E-03	-7.72E-05
3689.07337	-17.	12 7 5	12 7 6	6.11E-05	3.	6.32E-05	-3.5	7.73E-03	1.28E-04	9.58E-05
3690.31136	2.	2 0 2	2 2 1	1.50E-01	3.	1.48E-01	1.4	-3.86E-01	1.40E-03	-5.30E-05
3690.90936	1.	8 3 6	8 3 5	8.78E-03	4.	8.57E-03	2.4	1.00E-01	-8.39E-03	4.42E-04
3691.29811	-4.	2 1 2	3 1 3	1.68E+00	2.	1.69E+00	-.6	1.30E+00	1.74E-04	-9.67E-06
3691.84993	-1.	6 1 6	5 3 3	6.85E-04	2.	6.92E-04	-1.1	-2.44E-02	-2.08E-03	1.18E-04
3692.04209	-3.	4 1 4	3 3 1	3.87E-04	3.	3.86E-04	.2	-2.67E-02	7.36E-03	-3.44E-04
3693.78999	3.	6 2 5	6 2 4	3.40E-02	10.	3.62E-02	-6.6	-2.30E-01	-4.14E-02	1.93E-03
3693.83650	30.	9 3 7	8 5 4	1.17E-04	10.	1.18E-04	-.7	-9.05E-03	-1.85E-03	4.77E-05
3694.29272	0.	10 7 4	10 7 3	4.83E-04	2.	3.98E-04	17.6	1.97E-02	1.81E-04	7.65E-05
3694.35310	-6.	10 7 3	10 7 4	1.35E-03	7.	1.19E-03	11.8	3.41E-02	3.13E-04	1.32E-04
3694.37870	-23.	5 1 5	4 3 2	3.35E-03	10.	3.24E-03	3.4	-4.75E-02	-9.87E-03	5.11E-04
3695.02731	12.	9 2 8	8 4 5	2.08E-04	2.	2.16E-04	-3.6	-1.40E-02	-7.42E-04	5.94E-05
3695.62787	-6.	7 2 6	6 4 3	1.09E-03	2.	1.07E-03	1.7	-2.79E-02	-5.19E-03	3.54E-04
3696.27220	-23.	12 6 7	12 6 6	3.11E-05	10.	3.53E-05	-13.6	5.91E-03	1.98E-05	1.68E-05
3696.88720	16.	9 7 3	9 7 2	4.58E-03	4.	4.37E-03	4.7	6.55E-02	4.44E-04	1.28E-04
3696.89930	25.	9 7 2	9 7 3	1.53E-03	4.	1.46E-03	4.9	3.78E-02	2.56E-04	7.37E-05
3698.19290	-15.	8 2 7	7 4 4	1.74E-04	5.	1.85E-04	-6.4	-1.26E-02	-1.12E-03	8.90E-05
*3699.26850	-42.	8 7 1	8 7 2	2.11E-02	3.	1.91E-02	9.4	1.37E-01	6.91E-04	9.81E-05
3699.49370	-45.	11 5 7	11 5 6	6.09E-04	2.	6.24E-04	-2.4	2.53E-02	-4.10E-04	6.59E-05
3700.97390	-46.	10 3 8	9 5 5	1.55E-05	5.	1.59E-05	-2.8	-3.65E-03	-3.66E-04	2.19E-05
*3701.43090	-10.	7 7 1	7 7 0	5.90E-02	10.	5.64E-02	4.4	2.37E-01	9.00E-04	-2.60E-05
3701.76440	-3.	4 1 4	4 1 3	1.95E-01	3.	1.96E-01	-.4	4.06E-01	3.78E-02	-1.65E-03
3701.80563	-4.	1 1 0	2 1 1	1.15E+00	2.	1.20E+00	-4.3	1.10E+00	0.00E+00	0.00E+00
3703.81477	1.	6 3 3	7 1 6	1.39E-03	3.	1.36E-03	2.1	-3.59E-02	-1.04E-03	6.83E-05
3705.10890	-6.	11 6 5	11 6 6	1.63E-04	10.	1.64E-04	-.9	1.28E-02	2.85E-05	2.75E-05
3705.35657	12.	10 6 5	10 6 4	7.11E-04	2.	6.97E-04	1.9	2.63E-02	6.45E-05	3.78E-05
3705.68071	4.	8 0 8	7 2 5	6.42E-04	3.	6.35E-04	1.1	-2.46E-02	-6.19E-04	5.50E-05
3706.55178	0.	10 6 4	10 6 5	1.98E-03	3.	2.09E-03	-5.3	4.55E-02	1.02E-04	6.63E-05
3706.84138	5.	9 4 6	9 4 5	9.50E-03	6.	1.02E-02	-7.1	1.05E-01	-4.31E-03	3.16E-04
3707.83663	-13.	5 2 3	4 4 0	3.59E-04	2.	3.59E-04	.1	-2.03E-02	1.43E-03	-7.18E-05
3708.25824	-9.	9 6 4	9 6 3	7.71E-03	2.	7.78E-03	-.9	8.79E-02	2.01E-04	8.05E-05
3708.59779	-5.	9 6 3	9 6 4	2.60E-03	3.	2.59E-03	.5	5.07E-02	1.14E-04	4.67E-05
3708.95995	4.	6 4 2	7 2 5	9.00E-05	10.	9.82E-05	-9.1	-1.40E-02	4.21E-03	-1.53E-04
3709.40224	-3.	1 0 1	2 0 2	1.76E+00	3.	1.75E+00	.5	1.32E+00	7.34E-04	-2.82E-05
3709.77840	-11.	10 5 6	10 5 5	9.11E-04	4.	9.30E-04	-2.0	3.08E-02	-3.78E-04	6.10E-05
3710.70570	3.	8 6 3	8 6 2	8.37E-03	2.	8.62E-03	-3.0	9.26E-02	2.19E-04	4.59E-05
3710.78162	12.	8 6 2	8 6 3	2.75E-02	4.	2.58E-02	6.0	1.60E-01	3.77E-04	7.98E-05
3710.91681	-11.	7 3 5	7 3 4	7.43E-02	2.	7.43E-02	.0	3.00E-01	-2.94E-02	1.58E-03
3712.20450	-2.	1 1 1	2 1 2	3.71E+00	2.	3.78E+00	-2.0	1.95E+00	-1.43E-03	5.37E-05
3712.86700	-14.	7 6 2	7 6 1	8.32E-02	6.	7.70E-02	7.4	2.77E-01	7.38E-04	4.45E-05
3712.88000	76.	7 6 1	7 6 2	2.78E-02	6.	2.56E-02	7.8	1.60E-01	4.27E-04	2.57E-05

Table 10 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(001)	Z(100)	Z(020)
*3714.79480	-46.	6 6 0	6 6 1	2.81E-01	5.	2.77E-01	1.5	5.24E-01	1.66E-03	-5.65E-05
3716.16017	-12.	9 5 5	9 5 4	1.09E-02	2.	1.09E-02	-3.	1.05E-01	-9.21E-04	1.48E-04
3718.96313	-1.	5 2 4	5 2 3	5.18E-01	2.	5.31E-01	-2.5	6.52E-01	8.06E-02	-3.83E-03
3719.76210	-11.	8 4 5	8 4 4	1.32E-02	7.	1.27E-02	3.6	1.16E-01	-3.65E-03	2.70E-04
3720.13167	-10.	8 5 4	8 5 3	1.23E-02	3.	1.26E-02	-2.3	1.13E-01	-6.25E-04	1.03E-04
3721.87730	-8.	8 5 3	8 5 4	3.72E-02	2.	3.75E-02	-9.	1.95E-01	-1.15E-03	1.85E-04
3722.22221	1.	3 1 3	3 1 2	1.01E+00	2.	1.01E+00	.3	9.83E-01	2.09E-02	-9.22E-04
3722.82650	-16.	7 5 3	7 5 2	1.16E-01	8.	1.16E-01	.4	3.41E-01	-8.96E-04	1.73E-04
3723.27342	3.	7 5 2	7 5 3	3.78E-02	3.	3.83E-02	-1.4	1.96E-01	-5.32E-04	1.01E-04
3723.37897	0.	10 5 5	10 5 6	2.57E-03	2.	2.64E-03	-2.8	5.22E-02	-8.70E-04	1.27E-04
3724.89368	-3.	6 5 2	6 5 1	1.01E-01	3.	1.05E-01	-4.0	3.24E-01	2.49E-05	5.70E-05
3724.97444	-2.	6 5 1	6 5 2	3.18E-01	3.	3.15E-01	.9	5.61E-01	3.69E-05	9.92E-05
3725.68587	9.	6 3 4	6 3 3	6.71E-02	2.	6.95E-02	-3.5	2.89E-01	-2.65E-02	1.45E-03
3726.61600	-97.	5 5 1	5 5 0	7.70E-01	4.	7.78E-01	-1.0	8.80E-01	2.27E-03	-8.42E-05
3726.62300	-174.	5 5 0	5 5 1	2.57E-01	4.	2.59E-01	-9.	5.08E-01	1.31E-03	-4.86E-05
3727.00609	25.	4 3 1	5 1 4	2.43E-03	3.	2.55E-03	-4.9	5.73E-02	7.05E-03	-2.74E-04
3727.73751	-10.	7 4 4	7 4 3	1.25E-01	7.	1.26E-01	-.7	3.62E-01	-7.76E-03	5.74E-04
3730.00041	13.	7 0 7	6 2 4	8.19E-04	2.	7.95E-04	2.9	-2.76E-02	-6.47E-04	5.68E-05
3732.13433	0.	0 0 0	1 0 1	3.25E+00	3.	3.26E+00	-.3	1.81E+00	0.00E+00	0.00E+00
3732.28340	-29.	6 4 3	6 4 2	1.20E-01	10.	1.22E-01	-1.8	3.54E-01	-4.36E-03	3.24E-04
3732.50480	-1.	8 3 5	7 5 2	2.95E-04	4.	3.38E-04	-14.7	-2.05E-02	2.54E-03	-4.70E-04
3734.27265	3.	4 2 3	4 2 2	4.00E-01	2.	4.12E-01	-3.0	6.17E-01	2.59E-02	-1.24E-03
3734.64486	-9.	6 4 2	6 4 3	3.56E-01	2.	3.62E-01	-1.7	6.09E-01	-8.02E-03	5.92E-04
3734.93076	-10.	5 4 2	5 4 1	9.60E-01	4.	9.41E-01	2.0	9.74E-01	-4.40E-03	3.55E-04
3735.40650	-26.	7 4 3	7 4 4	4.10E-02	10.	4.04E-02	1.4	2.06E-01	-5.27E-03	3.87E-04
3735.44471	6.	5 4 1	5 4 2	3.18E-01	2.	3.13E-01	1.5	5.62E-01	-2.60E-03	2.08E-04
3735.49264	4.	5 3 3	5 3 2	6.10E-01	4.	5.89E-01	3.4	8.19E-01	-5.44E-02	3.00E-03
3736.68263	-7.	4 4 1	4 4 0	7.31E-01	2.	7.28E-01	.4	8.51E-01	1.75E-03	-6.77E-05
3736.74320	-8.	4 4 0	4 4 1	2.17E+00	2.	2.18E+00	-.4	1.47E+00	3.02E-03	-1.17E-04
3738.40066	-4.	2 1 2	2 1 1	6.69E-01	4.	6.45E-01	3.6	7.97E-01	5.65E-03	-2.51E-04
3739.09454	-15.	8 4 4	8 4 5	3.32E-02	2.	3.33E-02	-.2	1.91E-01	-9.32E-03	6.87E-04
3740.35815	0.	6 2 4	5 4 1	2.72E-03	3.	2.76E-03	-1.4	-5.44E-02	1.98E-03	-9.96E-05
3740.77450	-11.	4 2 2	5 0 5	4.50E-03	4.	4.50E-03	.0	-7.06E-02	3.69E-03	-1.26E-04
3740.86520	16.	3 2 1	4 0 4	4.75E-03	2.	4.67E-03	1.6	-7.05E-02	2.21E-03	-7.91E-05
3741.30612	1.	4 3 2	4 3 1	5.64E-01	4.	5.46E-01	3.2	7.62E-01	-2.48E-02	1.37E-03
3742.38540	-2.	4 1 3	3 3 0	9.13E-03	4.	9.03E-03	1.1	-9.54E-02	4.20E-04	8.77E-07
3742.78600	42.	5 4 1	6 2 4	5.26E-05	2.	4.97E-05	5.6	-8.98E-03	2.01E-03	-7.62E-05
3743.94635	-13.	4 3 1	4 3 2	1.52E+00	4.	1.52E+00	.0	1.28E+00	-5.04E-02	2.79E-03
3744.18430	-6.	5 3 2	5 3 3	1.13E-01	2.	1.20E-01	-6.0	3.90E-01	-4.64E-02	2.60E-03
3744.50953	11.	3 2 2	3 2 1	2.84E+00	5.	2.75E+00	3.2	1.63E+00	2.54E-02	-1.21E-03
3744.65110	-22.	3 3 1	3 3 0	4.46E+00	4.	4.39E+00	1.5	2.09E+00	3.24E-03	-1.30E-04
3745.08665	-17.	3 3 0	3 3 1	1.48E+00	4.	1.46E+00	1.1	1.21E+00	1.82E-03	-7.25E-05
3746.13222	-2.	9 4 5	9 4 6	2.03E-03	3.	2.11E-03	-3.8	5.10E-02	-5.50E-03	4.10E-04
3748.96668	15.	6 0 6	5 2 3	8.39E-03	4.	8.23E-03	1.9	-8.90E-02	-1.91E-03	1.54E-04
3749.32918	2.	1 1 1	1 1 0	4.38E+00	2.	4.35E+00	.8	2.08E+00	1.39E-03	-5.80E-05
3749.57387	3.	2 2 1	2 2 0	1.95E+00	2.	1.95E+00	-.2	1.40E+00	1.53E-03	-6.28E-05
3750.35256	5.	2 2 0	3 0 3	1.60E-02	5.	1.66E-02	-3.7	-1.32E-01	3.24E-03	-1.25E-04
3752.21253	1.	2 2 0	2 2 1	5.85E+00	2.	5.85E+00	.0	2.42E+00	2.14E-03	-8.63E-05
3754.66548	5.	3 0 3	2 2 0	1.36E-02	2.	1.34E-02	1.7	-1.14E-01	-1.71E-03	1.08E-04
3754.80912	-1.	3 3 0	4 1 3	7.71E-04	2.	7.90E-04	-2.4	-2.98E-02	1.75E-03	-6.78E-05
3756.61637	-1.	3 2 1	3 2 2	9.23E-01	2.	9.07E-01	1.8	9.42E-01	1.03E-02	-5.04E-04
3759.05008	-3.	6 3 3	6 3 4	2.67E-01	3.	2.74E-01	-2.5	4.76E-01	4.96E-02	-3.02E-03
3759.84453	5.	1 1 0	1 1 1	1.40E+00	3.	1.45E+00	-3.6	1.20E+00	0.00E+00	0.00E+00
3760.36371	-4.	5 0 5	4 2 2	7.74E-03	5.	8.00E-03	-3.3	-8.79E-02	-1.69E-03	1.31E-04
3762.47461	7.	4 0 4	3 2 1	4.66E-02	2.	4.70E-02	-.8	-2.13E-01	-3.69E-03	2.58E-04
3765.76026	3.	4 2 2	4 2 3	1.18E+00	2.	1.20E+00	-1.7	1.08E+00	1.97E-02	-9.89E-04
3766.05675	0.	5 1 4	4 3 1	7.05E-03	2.	7.15E-03	-1.5	-8.44E-02	-1.72E-04	4.00E-05
3766.36970	1.	9 3 6	8 5 3	9.75E-05	2.	9.96E-05	-2.1	-1.05E-02	6.60E-04	-1.04E-04
3769.88901	6.	2 1 1	2 1 2	1.90E+00	2.	1.94E+00	-2.2	1.39E+00	4.27E-03	-2.05E-04
3771.15237	3.	8 4 5	9 2 8	2.26E-05	2.	2.50E-05	-10.6	3.59E-03	1.46E-03	-5.10E-05
3771.21640	-22.	6 5 1	7 3 4	3.60E-06	10.	3.44E-06	4.6	-1.33E-04	2.07E-03	-7.93E-05
3773.44271	9.	9 4 6	10 2 9	5.35E-05	3.	5.90E-05	-10.2	5.99E-03	1.75E-03	-5.87E-05
3773.92682	-10.	10 4 6	10 4 7	2.76E-03	5.	2.61E-03	5.3	4.44E-02	7.27E-03	-5.24E-04
3776.54619	2.	7 5 3	8 3 6	3.08E-05	2.	3.14E-05	-1.8	3.46E-03	2.22E-03	-8.20E-05
3778.34031	1.	4 4 0	5 2 3	9.34E-05	2.	1.01E-04	-7.9	-1.22E-02	2.21E-03	-8.82E-05
3779.49311	4.	1 0 1	0 0 0	1.11E+00	4.	1.14E+00	-2.6	1.07E+00	-7.94E-04	3.77E-05
3779.76218	-1.	5 2 3	5 2 4	1.71E-01	3.	1.69E-01	1.4	4.02E-01	8.56E-03	-4.46E-04
3780.45500	-66.	6 4 3	7 2 6	4.80E-06	3.	4.72E-06	1.7	1.70E-04	2.08E-03	-7.82E-05
3781.46210	-58.	8 6 3	9 4 6	7.20E-06	10.	6.40E-06	11.2	1.89E-03	6.60E-04	-2.35E-05
3784.58370	9.	3 1 2	3 1 3	3.33E-01	3.	3.33E-01	-.1	5.74E-01	3.13E-03	-1.57E-04
3787.42186	7.	7 1 6	6 3 3	3.78E-03	10.	3.72E-03	1.7	-6.07E-02	-3.66E-04	7.22E-05
3788.64855	-9.	11 4 8	12 2 11	1.35E-05	4.	1.54E-05	-13.9	3.30E-03	6.40E-04	-2.01E-05
3788.80963	-2.	11 4 7	11 4 8	2.31E-04	2.	2.27E-04	1.8	1.39E-02	1.30E-03	-9.53E-05
3789.50010	-2.	12 4 8	11 6 5	4.96E-06	5.	5.82E-06	-17.3	-2.63E-03	2.22E-04	5.67E-08
3793.82515	0.	8 2 6	7 4 3	3.12E-03	2.	3.13E-03	-.5	-5.66E-02	5.72E-04	9.92E-06
3796.43955	4.	2 1 2	1 1 1	1.37E+00	2.	1.38E+00	-.9	1.18E+00	-3.46E-03	2.00E-04

Table 10 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(001)	Z(100)	Z(020)
3797.78793	0.	6 2 4	6 2 5	2.01E-01	3.	2.04E-01	-1.4	4.43E-01	9.20E-03	-4.98E-04
3798.52350	34.	4 3 2	5 1 5	2.84E-05	3.	2.94E-05	-3.6	-7.62E-03	2.28E-03	-9.27E-05
3801.41875	12.	2 0 2	1 0 1	5.75E+00	2.	5.77E+00	-4.	2.40E+00	-1.78E-03	9.13E-05
3802.35062	24.	11 2 9	10 4 6	3.08E-05	5.	3.38E-05	-9.9	-5.92E-03	9.99E-05	7.72E-06
3802.96564	3.	4 1 3	4 1 4	5.22E-01	2.	5.32E-01	-1.9	7.25E-01	4.42E-03	-2.31E-04
3804.89390	-1.	8 2 6	9 0 9	4.83E-05	2.	5.78E-05	-19.6	5.78E-03	1.89E-03	-6.53E-05
3805.23162	11.	3 3 1	4 1 4	2.94E-04	2.	3.00E-04	-2.2	-1.96E-02	2.36E-03	-9.61E-05
3806.05000	3.	9 3 6	9 3 7	3.31E-03	2.	3.40E-03	-2.8	5.61E-02	2.35E-03	-1.49E-04
3806.35310	-1.	7 6 2	8 4 5	1.79E-05	2.	1.63E-05	8.7	2.89E-03	1.20E-03	-4.54E-05
3807.01355	-4.	2 1 1	1 1 0	3.92E+00	2.	3.95E+00	-8.	1.99E+00	-5.32E-03	2.99E-04
3808.01870	-1.	9 2 7	8 4 4	5.24E-04	2.	5.27E-04	-6.	-2.32E-02	1.96E-04	1.68E-05
3808.59505	2.	12 4 8	12 4 9	1.44E-04	3.	1.42E-04	1.1	1.13E-02	7.18E-04	-5.19E-05
3809.11080	-4.	7 3 5	8 1 8	9.51E-05	3.	1.02E-04	-7.0	7.01E-03	3.19E-03	-1.18E-04
3810.82460	4.	10 2 8	9 4 5	4.86E-04	3.	4.89E-04	-6.	-2.24E-02	2.45E-04	2.47E-05
3815.64696	2.	2 2 1	2 0 2	4.78E-02	2.	4.44E-02	7.1	-2.13E-01	1.95E-03	-9.31E-05
3816.09162	0.	3 1 3	2 1 2	5.78E+00	2.	5.77E+00	.2	2.41E+00	-8.63E-03	5.73E-04
3818.34118	8.	7 2 5	7 2 6	2.63E-02	2.	2.67E-02	-1.4	1.61E-01	2.88E-03	-1.61E-04
3818.93120	-7.	11 3 8	10 5 5	2.80E-05	8.	2.91E-05	-4.0	-5.55E-03	1.65E-04	-1.26E-05
3819.90390	-23.	3 2 2	3 0 3	2.78E-01	3.	2.72E-01	2.1	-5.23E-01	1.72E-03	-5.68E-05
3820.73857	4.	3 0 3	2 0 2	2.17E+00	2.	2.19E+00	-.8	1.48E+00	-6.98E-04	3.56E-05
3821.76403	-11.	3 2 2	2 2 1	2.65E+00	2.	2.60E+00	2.0	1.63E+00	-2.44E-02	1.72E-03
3823.27380	0.	5 1 4	5 1 5	9.44E-02	2.	9.44E-02	.0	3.06E-01	1.53E-03	-8.43E-05
3825.26180	-29.	9 2 7	10 0 10	1.64E-05	3.	1.75E-05	-6.9	3.42E-03	7.93E-04	-2.75E-05
3826.75401	12.	3 2 1	2 2 0	8.45E-01	2.	8.67E-01	-2.6	9.41E-01	-1.05E-02	7.46E-04
3827.50433	-1.	10 3 7	10 3 8	2.90E-03	4.	2.82E-03	2.6	5.16E-02	1.68E-03	-1.08E-04
3827.99955	16.	4 2 3	4 0 4	9.50E-02	2.	9.58E-02	-.8	-3.09E-01	-1.04E-03	9.36E-05
3831.26400	2.	12 3 9	11 5 6	2.75E-05	4.	2.64E-05	4.0	-5.30E-03	1.71E-04	-7.38E-06
3831.68608	-8.	3 1 2	2 1 1	1.71E+00	2.	1.73E+00	-1.3	1.32E+00	-3.16E-03	1.98E-04
3834.98299	1.	4 1 4	3 1 3	1.84E+00	3.	1.85E+00	-.7	1.37E+00	-1.09E-02	8.70E-04
3837.86922	-3.	4 0 4	3 0 3	6.13E+00	2.	6.10E+00	.5	2.47E+00	-3.61E-04	0.00E+00
3839.46203	-1.	8 2 6	8 2 7	3.07E-02	3.	3.03E-02	1.3	1.72E-01	2.43E-03	-1.37E-04
3839.92933	5.	4 3 2	3 3 1	3.85E-01	3.	4.04E-01	-.50	6.03E-01	3.58E-02	-3.33E-03
3840.12611	20.	5 2 4	5 0 5	1.86E-01	2.	1.95E-01	-.50	-4.36E-01	-6.53E-03	4.95E-04
3841.04480	1.	4 3 1	3 3 0	1.14E+00	2.	1.16E+00	-2.2	1.01E+00	7.09E-02	-6.61E-03
3843.50462	-2.	6 1 5	6 1 6	1.42E-01	3.	1.45E-01	-2.0	3.79E-01	1.21E-03	-6.94E-05
3843.75074	1.	4 2 3	3 2 2	1.03E+00	3.	1.04E+00	-.9	1.03E+00	-1.63E-02	1.38E-03
3844.84720	7.	5 3 3	5 1 4	5.50E-02	3.	5.55E-02	-.9	-2.45E-01	9.83E-03	-6.86E-04
3848.83730	-21.	10 3 8	11 1 11	1.14E-05	3.	1.21E-05	-.58	2.93E-03	5.64E-04	-1.95E-05
3849.05949	3.	7 3 5	7 1 6	3.62E-02	3.	3.54E-02	2.2	-1.93E-01	5.75E-03	-4.92E-04
3849.65200	42.	4 3 2	4 1 3	1.53E-02	6.	1.52E-02	.7	-1.27E-01	4.27E-03	-2.69E-04
3849.86689	3.	6 2 5	6 0 6	3.45E-02	4.	3.38E-02	2.0	-1.88E-01	4.05E-03	-3.09E-04
3852.05752	9.	5 1 5	4 1 4	4.75E+00	3.	4.80E+00	-1.1	2.19E+00	6.27E-03	-6.49E-04
3853.96617	2.	4 2 2	3 2 1	3.06E+00	2.	3.15E+00	-.8	1.79E+00	-1.37E-02	1.15E-03
3854.09054	2.	5 0 5	4 0 4	1.65E+00	3.	1.64E+00	.6	1.28E+00	1.79E-05	-1.99E-05
3854.43822	3.	4 1 3	3 1 2	4.80E+00	3.	4.75E+00	1.0	2.18E+00	-4.23E-03	2.94E-04
3856.70411	2.	3 3 1	3 1 2	2.24E-02	3.	2.27E-02	-1.3	-1.54E-01	3.81E-03	-2.04E-04
3857.16419	-14.	5 4 2	4 4 1	4.60E-01	3.	4.59E-01	.1	6.69E-01	1.06E-02	-1.46E-03
3857.42489	-2.	5 4 1	4 4 0	1.53E-01	3.	1.53E-01	-.1	3.86E-01	6.16E-03	-8.47E-04
3858.17675	6.	3 3 6	8 1 7	6.60E-03	2.	6.60E-03	.1	-8.24E-02	1.32E-03	-1.36E-04
3859.40888	4.	9 2 7	9 2 8	3.60E-03	3.	3.60E-03	-.1	5.94E-02	6.48E-04	-3.48E-05
3861.78775	-2.	5 3 3	4 3 2	1.16E+00	2.	1.18E+00	-1.6	1.04E+00	4.72E-02	-5.51E-03
3862.49151	0.	7 1 6	7 1 7	2.40E-02	2.	2.32E-02	3.5	1.52E-01	2.48E-04	-1.41E-05
3863.31982	1.	2 2 0	1 0 1	1.13E-01	2.	1.14E-01	-.1	3.41E-01	-2.71E-03	1.48E-04
3864.30996	2.	5 3 2	4 3 1	2.81E-01	2.	2.84E-01	-1.2	4.99E-01	3.89E-02	-4.55E-03
3865.11147	-6.	5 2 4	4 2 3	2.32E+00	3.	2.34E+00	-.1	1.56E+00	-3.46E-02	3.67E-03
3866.10922	5.	7 2 6	7 0 7	6.30E-02	5.	6.39E-02	-.14	-2.54E-01	1.49E-03	-1.26E-04
3866.75920	22.	10 4 7	10 2 8	4.50E-04	3.	4.47E-04	.7	-2.14E-02	2.82E-04	-4.86E-05
3868.62621	15.	8 4 5	8 2 6	1.83E-03	2.	1.86E-03	-.18	-4.44E-02	1.35E-03	-1.27E-04
3869.19255	-2.	6 1 6	5 1 5	1.16E+00	3.	1.16E+00	-.1	1.08E+00	5.77E-04	-9.33E-05
3870.12933	3.	6 0 6	5 0 5	3.55E+00	3.	3.50E+00	1.4	1.87E+00	2.91E-05	-3.82E-05
3871.45334	0.	6 5 2	5 5 1	4.26E-02	2.	4.12E-02	3.2	2.02E-01	1.51E-03	-4.09E-04
3871.49690	-2.	6 5 1	5 5 0	1.25E-01	3.	1.23E-01	1.3	3.49E-01	2.62E-03	-7.09E-04
3872.73552	17.	11 4 8	11 2 9	4.88E-04	2.	4.75E-04	2.7	-2.18E-02	6.15E-05	-3.56E-05
3874.40219	-4.	5 1 4	4 1 3	1.17E+00	2.	1.17E+00	.3	1.08E+00	-1.50E-03	1.11E-04
3876.56499	10.	7 4 4	7 2 5	7.67E-03	2.	7.83E-03	-2.1	-9.16E-02	3.36E-03	-2.69E-04
3877.42595	10.	10 2 8	10 2 9	3.65E-03	3.	3.58E-03	1.9	5.93E-02	5.25E-04	-2.49E-05
3877.85920	39.	12 3 10	13 1 13	2.30E-06	10.	2.46E-06	-.72	1.37E-03	2.10E-04	-7.13E-06
3878.80770	39.	12 5 8	12 3 9	1.34E-05	3.	1.31E-05	2.3	-3.63E-03	2.86E-05	-1.28E-05
3879.94944	-1.	6 4 3	5 4 2	1.43E-01	2.	1.47E-01	-2.7	3.79E-01	4.69E-03	-9.15E-04
3880.14010	1.	8 1 7	8 1 8	3.24E-02	3.	3.05E-02	5.7	1.75E-01	1.20E-04	-5.67E-06
3880.19146	7.	5 2 3	4 2 2	8.75E-01	3.	8.61E-01	1.6	9.32E-01	-4.60E-03	4.60E-04
3880.35470	-2.	6 2 5	5 2 4	5.41E-01	2.	5.50E-01	-.7	7.31E-01	1.19E-02	-1.71E-03
3881.02852	-5.	6 4 2	5 4 1	4.42E-01	3.	4.38E-01	1.0	6.55E-01	8.30E-03	-1.63E-03
3881.65540	-4.	12 4 9	12 2 10	4.84E-05	2.	4.69E-05	3.2	-6.80E-03	-4.23E-05	-6.50E-06
3881.87329	1.	8 2 7	8 0 8	9.63E-03	2.	9.86E-03	-.3	-9.95E-02	2.34E-04	-2.26E-05
3882.93702	5.	10 3 8	10 1 9	1.11E-03	2.	1.07E-03	3.4	-3.27E-02	-2.53E-05	-1.37E-05

Table 10 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(001)	Z(100)	Z(020)
3883.26659	0.	6 3 4	5 3 3	2.83E-01	3.	2.85E-01	-.8	5.22E-01	1.48E-02	-2.33E-03
3884.00370	0.	7 6 2	6 6 1	2.85E-02	5.	2.57E-02	9.8	1.61E-01	1.54E-04	-4.10E-04
3884.01100	33.	7 6 1	6 6 0	9.50E-03	5.	8.58E-03	9.7	9.28E-02	8.86E-05	-2.37E-04
3885.26590	-16.	11 5 7	11 3 8	1.05E-04	4.	1.08E-04	-3.0	-1.06E-02	2.25E-04	-4.22E-05
3886.07711	-7.	7 0 7	6 0 6	7.30E-01	2.	7.38E-01	-1.1	8.59E-01	-3.99E-05	-1.70E-05
3887.29052	14.	6 4 3	6 2 4	2.78E-03	2.	2.79E-03	-.4	-5.50E-02	2.39E-03	-1.68E-04
3888.02770	2.	3 3 0	3 1 3	2.50E-03	3.	2.52E-03	-.6	-5.21E-02	2.01E-03	-1.11E-04
3891.29955	8.	6 1 5	5 1 4	2.20E+00	2.	2.21E+00	-.3	1.49E+00	-1.31E-03	8.72E-05
3892.14470	-8.	13 4 10	13 2 11	3.50E-05	4.	3.55E-05	-1.5	-5.68E-03	-7.61E-05	-2.36E-06
3892.82703	3.	3 2 1	2 0 2	7.30E-02	4.	7.59E-02	-4.0	2.77E-01	-1.43E-03	6.17E-05
3893.66732	-10.	11 2 9	11 2 10	3.72E-04	3.	3.62E-04	2.6	1.89E-02	1.51E-04	-6.05E-06
3894.06345	9.	7 5 3	6 5 2	9.70E-02	6.	1.07E-01	-10.7	3.27E-01	1.26E-03	-7.31E-04
3894.28720	-20.	7 5 2	6 5 1	3.45E-02	3.	3.57E-02	-3.5	1.89E-01	7.29E-04	-4.23E-04
*3895.14470	-8.	8 7 1	7 7 0	5.63E-03	2.	5.54E-03	1.6	7.54E-02	-4.29E-04	-5.57E-04
3896.41966	0.	11 3 9	11 1 10	1.06E-03	3.	1.03E-03	2.9	-3.19E-02	-1.36E-04	-4.51E-06
3896.78093	3.	9 1 8	9 1 9	4.07E-03	4.	4.09E-03	-.5	6.40E-02	1.53E-05	-3.63E-08
3897.56735	-3.	9 2 8	9 0 9	1.24E-02	3.	1.21E-02	2.6	-1.10E-01	1.13E-04	-1.31E-05
3898.76160	25.	5 4 2	5 2 3	6.39E-03	2.	6.68E-03	-4.5	-8.57E-02	4.30E-03	-2.77E-04
3899.21671	-4.	6 3 3	5 3 2	6.85E-01	2.	6.94E-01	-1.2	8.52E-01	-2.35E-02	4.22E-03
3899.44135	2.	7 2 6	6 2 5	1.14E+00	2.	1.15E+00	-1.2	1.07E+00	2.60E-03	-6.57E-04
3901.66640	-7.	8 1 8	7 1 7	4.20E-01	3.	4.17E-01	.7	6.46E-01	-5.77E-05	-1.52E-05
3901.84695	0.	8 0 8	7 0 7	1.26E+00	2.	1.25E+00	.8	1.12E+00	-1.31E-04	-1.79E-05
3902.24993	0.	7 4 4	6 4 3	2.86E-01	2.	2.85E-01	.4	5.31E-01	4.10E-03	-1.38E-03
3904.18862	-2.	6 2 4	5 2 3	1.62E+00	4.	1.67E+00	-3.1	1.30E+00	-4.06E-03	4.87E-04
3904.29472	-9.	7 3 5	6 3 4	5.24E-01	2.	5.43E-01	-3.7	7.30E-01	9.26E-03	-2.32E-03
*3905.00540	19.	9 8 2	8 8 1	7.18E-04	2.	7.17E-04	.1	2.72E-02	-5.18E-04	6.35E-05
3905.12630	11.	6 4 2	7 0 7	2.65E-05	4.	2.35E-05	11.2	-3.69E-03	-1.21E-03	4.84E-05
3905.37036	-11.	7 4 3	6 4 2	9.30E-02	4.	9.28E-02	-.2	3.03E-01	2.53E-03	-8.73E-04
3906.06470	-22.	7 1 6	6 1 5	4.10E-01	5.	4.15E-01	-1.1	6.44E-01	-3.73E-04	9.01E-06
3906.15740	-39.	8 6 3	7 6 2	6.90E-03	3.	6.65E-03	3.7	8.20E-02	-2.70E-04	-2.31E-04
3906.19830	-14.	8 6 2	7 6 1	2.08E-02	2.	2.00E-02	4.1	1.42E-01	-4.69E-04	-4.00E-04
3908.58147	-4.	12 2 10	12 2 11	3.04E-04	2.	3.04E-04	.1	1.73E-02	1.36E-04	-4.79E-06
3909.03739	6.	4 4 1	4 2 2	1.08E-03	2.	1.11E-03	-2.9	-3.52E-02	1.99E-03	-1.21E-04
3909.91418	7.	12 3 10	12 1 11	1.01E-04	4.	9.82E-05	2.7	-9.85E-03	-6.25E-05	1.95E-07
3910.53870	15.	9 5 5	9 3 6	4.21E-04	2.	4.13E-04	1.8	-2.13E-02	1.08E-03	-1.07E-04
3912.70679	-1.	10 1 9	10 1 10	4.34E-03	2.	4.50E-03	-3.7	6.71E-02	5.55E-06	7.96E-07
3913.02713	-26.	10 2 9	10 0 10	1.48E-03	2.	1.49E-03	-.6	-3.86E-02	2.03E-05	-6.08E-06
*3913.85460	0.	10 9 1	9 9 0	7.44E-05	4.	7.19E-05	3.3	8.78E-03	-2.99E-04	2.82E-07
3914.41410	24.	15 4 12	15 2 13	1.86E-06	10.	1.85E-06	.8	-1.36E-03	1.43E-05	-8.78E-06
3916.32873	0.	8 2 7	7 2 6	2.10E-01	3.	2.04E-01	2.9	4.52E-01	4.46E-05	-1.19E-04
3916.78470	-19.	9 7 3	8 7 2	2.95E-03	2.	2.86E-03	3.1	5.45E-02	-5.45E-04	-4.85E-04
3916.79260	96.	9 7 2	8 7 1	9.83E-04	2.	9.54E-04	3.0	3.15E-02	-3.15E-04	-2.80E-04
3917.20860	-9.	8 5 3	7 5 2	6.00E-02	3.	6.24E-02	-4.0	2.51E-01	-1.74E-04	-6.16E-04
3917.28587	-3.	9 1 9	8 1 8	6.50E-01	4.	6.35E-01	2.3	7.97E-01	-1.41E-04	-9.52E-06
3917.36263	-21.	9 0 9	8 0 8	2.18E-01	3.	2.12E-01	2.8	4.60E-01	-8.29E-05	-5.14E-06
3920.08860	-11.	8 1 7	7 1 6	6.50E-01	3.	6.33E-01	2.6	7.96E-01	-4.15E-04	-1.32E-05
3921.52710	11.	5 3 2	5 1 5	5.84E-04	3.	5.87E-04	-.6	-2.71E-02	3.10E-03	-2.45E-04
*3921.78300	42.	11 10 2	10 10 1	6.10E-06	2.	5.58E-06	8.5	2.51E-03	-1.48E-04	-3.21E-06
3922.53870	3.	13 2 11	13 2 12	2.65E-05	2.	2.57E-05	3.0	5.03E-03	4.20E-05	-1.41E-06
3923.16440	8.	13 3 11	13 1 12	8.00E-05	2.	7.57E-05	5.3	-8.64E-03	-6.72E-05	1.03E-06
3923.79370	-18.	8 4 5	7 4 4	4.99E-02	3.	4.93E-02	1.1	2.22E-01	4.57E-04	-5.95E-04
3924.37270	-8.	8 3 6	7 3 5	9.80E-02	3.	9.97E-02	-1.7	3.15E-01	8.72E-04	-6.00E-04
3924.48877	8.	4 4 0	4 2 3	2.38E-03	3.	2.49E-03	-4.8	-5.33E-02	3.58E-03	-2.22E-04
3925.13435	0.	7 3 4	6 3 3	1.86E-01	5.	1.83E-01	1.8	4.30E-01	-3.63E-03	9.46E-04
3925.17576	-6.	7 2 5	6 2 4	2.99E-01	2.	2.98E-01	.3	5.47E-01	-1.08E-03	1.52E-04
3925.88570	6.	8 5 4	8 3 5	2.02E-04	2.	2.00E-04	1.2	-1.51E-02	1.02E-03	-8.69E-05
*3926.02700	-10.	10 8 2	9 8 1	4.60E-04	5.	4.38E-04	4.9	2.14E-02	-5.73E-04	4.55E-05
3928.02987	-3.	9 6 4	8 6 3	1.06E-02	2.	1.04E-02	2.3	1.03E-01	-8.65E-04	-3.18E-04
3928.08758	-13.	11 1 10	11 1 11	5.12E-04	4.	5.00E-04	2.3	2.24E-02	1.61E-06	2.80E-07
3928.20142	-1.	9 6 3	8 6 2	3.58E-03	2.	3.47E-03	3.1	5.96E-02	-5.01E-04	-1.84E-04
3929.36088	2.	4 2 2	3 0 3	1.96E-01	3.	1.99E-01	-1.6	4.48E-01	-2.10E-03	4.24E-05
3930.56606	-6.	8 4 4	7 4 3	1.38E-01	2.	1.36E-01	1.7	3.69E-01	8.85E-04	-1.33E-03
3932.13541	-10.	9 2 8	8 2 7	2.90E-01	3.	2.87E-01	1.2	5.36E-01	-3.21E-04	-7.18E-05
3932.54540	18.	10 1 10	9 1 9	9.80E-02	5.	9.70E-02	1.1	3.11E-01	-7.08E-05	-7.53E-06
3932.58070	13.	10 0 10	9 0 9	2.80E-01	6.	2.91E-01	-3.9	5.39E-01	-1.26E-04	-2.93E-06
3934.10055	-1.	9 1 8	8 1 7	9.10E-02	5.	9.73E-02	-6.9	3.12E-01	-1.94E-04	-9.09E-06
*3934.26200	-58.	11 9 3	10 9 2	3.50E-05	5.	3.88E-05	-11.0	6.52E-03	-2.87E-04	-7.84E-07
3935.13027	4.	3 3 0	2 1 1	1.33E-02	4.	1.35E-02	-1.2	1.18E-01	-2.03E-03	1.41E-04
3935.78200	-299.	14 2 12	14 2 13	1.80E-05	10.	2.00E-05	-11.0	4.48E-03	-1.22E-05	-1.17E-06
3936.03580	-46.	14 3 12	14 1 13	6.22E-06	4.	6.61E-06	-6.3	-2.57E-03	-1.29E-06	3.24E-06
3938.07878	66.	10 7 4	9 7 3	4.77E-04	2.	4.41E-04	7.6	2.15E-02	-3.13E-04	-2.36E-04
3938.11055	5.	10 7 3	9 7 2	1.33E-03	2.	1.32E-03	.8	3.73E-02	-5.42E-04	-4.09E-04
3938.29080	-10.	9 5 5	8 5 4	2.98E-02	3.	2.91E-02	2.4	1.72E-01	-1.03E-03	-4.51E-04
3938.45846	11.	6 4 2	6 2 5	2.35E-03	3.	2.41E-03	-2.7	-5.30E-02	4.20E-03	-3.04E-04
3940.30553	2.	7 5 3	7 3 4	7.12E-04	2.	7.16E-04	-.6	-2.91E-02	2.50E-03	-1.93E-04
3940.58899	5.	9 5 4	8 5 3	9.80E-03	4.	9.58E-03	2.3	9.87E-02	-6.22E-04	-2.67E-04

Table 10 continued

observed frequency	o-c	upper J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	z(001)	z(100)	z(020)
*3941.53000	-7.	12 10 2	11 10 1	3.06E-06	4.	2.65E-06	13.4	1.76E-03	-1.27E-04	-2.66E-06
3941.63510	22.	8 4 4	9 0 9	1.75E-05	3.	1.47E-05	16.2	-3.19E-03	-6.57E-04	2.15E-05
3942.65235	-8.	8 2 6	7 2 5	4.21E-01	4.	4.12E-01	2.1	6.43E-01	-8.27E-04	1.22E-04
3942.88695	-7.	9 3 7	8 3 6	1.33E-01	3.	1.39E-01	-4.7	3.74E-01	-5.65E-04	-3.92E-04
3943.00870	-5.	12 1 11	12 1 12	4.40E-04	6.	4.55E-04	-3.4	2.13E-02	2.92E-06	0.00E+00
3943.07150	36.	12 2 11	12 0 12	1.40E-04	5.	1.52E-04	-8.6	-1.23E-02	-5.68E-07	-3.56E-07
3944.36797	-16.	9 4 6	8 4 5	6.61E-02	2.	6.54E-02	1.1	2.57E-01	-9.83E-04	-6.57E-04
3946.60830	13.	11 8 4	10 8 3	1.37E-04	4.	1.34E-04	1.8	1.20E-02	-4.27E-04	2.28E-05
3946.61300	-114.	11 8 3	10 8 2	4.58E-05	4.	4.48E-05	2.1	6.93E-03	-2.46E-04	1.32E-05
3947.17420	6.	10 2 9	9 2 8	4.00E-02	10.	4.02E-02	-5.	2.01E-01	-1.61E-04	-4.59E-05
3947.46310	-8.	11 1 11	10 1 10	1.32E-01	4.	1.21E-01	8.4	3.48E-01	-9.76E-05	-8.25E-07
3947.47700	-142.	11 0 11	10 0 10	4.43E-02	4.	4.02E-02	9.3	2.00E-01	-5.64E-05	4.47E-07
3948.17703	-6.	10 1 9	9 1 8	1.24E-01	5.	1.22E-01	1.8	3.49E-01	-2.73E-04	-9.74E-06
3949.57283	0.	10 6 5	9 6 4	1.46E-03	3.	1.44E-03	1.5	3.86E-02	-5.52E-04	-1.29E-04
3949.98370	4.	8 3 5	7 3 4	2.95E-01	2.	2.82E-01	4.3	5.32E-01	-1.39E-03	6.50E-04
3950.14177	-1.	10 6 4	9 6 3	4.22E-03	3.	4.30E-03	-2.0	6.68E-02	-9.61E-04	-2.23E-04
3950.57352	1.	3 3 1	2 1 2	2.41E-02	3.	2.47E-02	-2.6	1.60E-01	-3.27E-03	2.34E-04
3951.97760	15.	6 5 2	6 3 3	2.19E-04	2.	2.27E-04	-3.9	-1.67E-02	1.71E-03	-1.24E-04
3953.09761	5.	4 3 1	3 1 2	7.50E-02	2.	7.67E-02	-2.2	2.81E-01	-5.08E-03	5.71E-04
3953.54240	-4.	7 4 3	7 2 6	3.33E-04	2.	3.23E-04	3.0	-1.97E-02	1.87E-03	-1.53E-04
*3954.15800	0.	12 9 3	11 9 2	1.33E-05	10.	1.40E-05	-5.2	3.96E-03	-2.20E-04	-1.03E-06
3955.24158	3.	9 4 5	8 4 4	1.59E-02	2.	1.57E-02	1.5	1.27E-01	-1.03E-03	-6.88E-04
3956.88258	2.	9 2 7	8 2 6	5.80E-02	4.	5.59E-02	3.6	2.37E-01	-2.41E-04	2.49E-05
3957.51440	68.	13 1 12	13 1 13	4.48E-05	2.	4.19E-05	6.4	6.47E-03	1.62E-06	-9.54E-08
3957.53440	10.	13 2 12	13 0 13	1.34E-04	2.	1.26E-04	5.9	-1.12E-02	-2.35E-06	-1.00E-07
3959.02056	-12.	11 7 5	10 7 4	4.93E-04	2.	4.83E-04	2.1	2.27E-02	-4.25E-04	-3.18E-04
3959.14182	1.	11 7 4	10 7 3	1.62E-04	2.	1.61E-04	.7	1.31E-02	-2.47E-04	-1.82E-04
3959.50315	1.	10 5 6	9 5 5	3.81E-03	2.	3.78E-03	.9	6.24E-02	-7.46E-04	-1.72E-04
3959.72385	-3.	10 3 8	9 3 7	1.86E-02	3.	1.86E-02	.2	1.37E-01	-3.92E-04	-7.99E-05
3959.88126	6.	5 5 1	5 3 2	3.88E-04	2.	4.20E-04	-8.2	-2.30E-02	2.65E-03	-1.83E-04
*3960.70100	0.	13 10 4	12 10 3	9.60E-07	10.	8.35E-07	13.0	1.00E-03	-8.93E-05	-1.71E-06
3960.77651	6.	6 3 3	6 1 6	1.26E-03	2.	1.27E-03	-.7	-3.69E-02	1.26E-03	-6.13E-06
3961.71241	-15.	11 2 10	10 2 9	4.98E-02	3.	4.58E-02	8.0	2.14E-01	-2.21E-04	-1.25E-05
*3962.04000	-194.	12 0 12	11 0 11	6.60E-02	4.	6.04E-02	8.5	2.46E-01	-8.02E-05	3.71E-06
3962.18706	-11.	11 1 10	10 1 9	1.65E-02	4.	1.53E-02	7.5	1.24E-01	-1.17E-04	-2.13E-06
3963.84268	-3.	10 4 7	9 4 6	8.51E-03	2.	8.47E-03	.5	9.30E-02	-7.94E-04	-2.03E-04
3964.36560	32.	10 6 5	10 4 6	5.83E-06	4.	5.47E-06	6.1	-2.60E-03	2.94E-04	-3.33E-05
3964.59460	9.	6 5 1	6 3 4	5.10E-04	2.	5.35E-04	-4.9	-2.60E-02	3.10E-03	-2.28E-04
3964.72956	-10.	5 5 0	5 3 3	1.21E-04	4.	1.29E-04	-6.6	-1.28E-02	1.56E-03	-1.09E-04
3964.80043	2.	10 5 5	9 5 4	1.11E-02	2.	1.09E-02	1.5	1.06E-01	-1.42E-03	-3.19E-04
3966.22570	-11.	7 5 2	7 3 5	1.37E-04	2.	1.40E-04	-2.2	-1.33E-02	1.56E-03	-1.23E-04
3966.74960	-10.	12 8 5	11 8 4	1.54E-05	2.	1.46E-05	5.0	4.00E-03	-1.82E-04	6.70E-06
3966.77380	-2.	12 8 4	11 8 3	4.62E-05	2.	4.38E-05	5.2	6.92E-03	-3.16E-04	1.16E-05
3969.13850	10.	10 2 8	9 2 7	6.48E-02	6.	6.19E-02	4.5	2.49E-01	-2.83E-04	8.97E-06
3970.68035	10.	11 6 6	10 6 5	1.54E-03	2.	1.49E-03	3.0	3.96E-02	-8.34E-04	-1.41E-04
3970.92830	10.	8 5 3	8 3 6	2.15E-04	2.	2.17E-04	-.9	-1.65E-02	1.96E-03	-1.71E-04
3971.62750	7.	14 2 13	14 0 14	1.07E-05	2.	1.05E-05	1.8	-3.24E-03	-1.27E-06	7.58E-08
3971.65630	16.	14 1 13	14 1 14	3.15E-05	3.	3.17E-05	-.7	5.63E-03	2.63E-06	-4.62E-07
3972.12340	-16.	9 3 6	8 3 5	3.70E-02	8.	3.89E-02	-5.2	1.97E-01	-1.24E-04	1.52E-04
3972.24483	3.	11 6 5	10 6 4	4.96E-04	3.	4.96E-04	-.1	2.28E-02	-4.87E-04	-8.20E-05
3972.65547	6.	5 3 2	4 1 3	2.40E-02	2.	2.51E-02	-4.6	1.61E-01	-2.80E-03	5.93E-04
3973.91817	1.	5 2 3	4 0 4	3.52E-02	4.	3.57E-02	-1.5	1.90E-01	-1.25E-03	0.00E+00
3975.13933	0.	11 3 9	10 3 8	2.12E-02	2.	1.98E-02	6.8	1.41E-01	-4.49E-04	-4.79E-05
3975.77790	-6.	12 2 11	11 2 10	5.40E-03	4.	5.24E-03	3.0	7.25E-02	-8.41E-05	-2.04E-06
3976.00866	7.	12 1 11	11 1 10	1.66E-02	2.	1.58E-02	5.0	1.26E-01	-1.39E-04	3.70E-07
3976.20310	9.	8 4 4	8 2 7	2.06E-04	2.	1.97E-04	4.1	-1.59E-02	2.09E-03	-2.03E-04
*3976.26390	80.	13 1 13	12 1 12	2.40E-02	4.	2.06E-02	14.2	1.44E-01	-5.38E-05	5.81E-06
3979.40620	20.	9 6 4	9 4 5	2.63E-05	4.	2.56E-05	2.8	-5.87E-03	9.07E-04	-8.92E-05
3979.59420	-4.	12 7 6	11 7 5	5.03E-05	2.	4.86E-05	3.5	7.26E-03	-1.56E-04	-1.36E-04
3979.77063	-2.	11 5 7	10 5 6	3.94E-03	4.	3.81E-03	3.4	6.30E-02	-1.14E-03	-1.76E-04
3979.96762	5.	12 7 5	11 7 4	1.63E-04	4.	1.47E-04	10.1	1.26E-02	-2.75E-04	-2.29E-04
3980.26920	-2.	9 5 4	9 3 7	2.52E-05	2.	2.44E-05	3.0	-5.59E-03	7.11E-04	-7.00E-05
3980.83483	2.	11 2 9	10 2 8	7.11E-03	4.	6.97E-03	2.0	8.36E-02	-1.26E-04	-5.28E-07
3982.06360	-17.	11 4 8	10 4 7	8.88E-03	2.	8.77E-03	1.2	9.49E-02	-1.04E-03	-1.56E-04
3982.87038	24.	4 3 2	3 1 3	1.05E-02	4.	1.09E-02	-3.7	1.06E-01	-2.22E-03	2.48E-04
3985.13240	40.	15 1 14	15 1 15	2.76E-06	10.	2.42E-06	12.3	1.56E-03	2.68E-07	-8.29E-08
3986.44470	-7.	13 8 6	12 8 5	1.21E-05	2.	1.20E-05	1.2	3.66E-03	-2.09E-04	5.40E-06
3986.52670	38.	13 8 5	12 8 4	4.20E-06	5.	3.99E-06	5.1	2.11E-03	-1.20E-04	3.14E-06
3989.56902	0.	13 1 12	12 1 11	1.62E-03	2.	1.64E-03	-1.0	4.05E-02	-5.11E-05	1.76E-06
3989.82645	-4.	11 5 6	10 5 5	1.15E-03	2.	1.17E-03	-1.4	3.51E-02	-8.07E-04	-1.22E-04
3990.27240	-9.	14 0 14	13 0 13	4.70E-03	10.	4.79E-03	-1.9	6.92E-02	-3.08E-05	9.74E-06
3990.57220	21.	8 6 3	8 4 4	1.20E-05	10.	1.13E-05	6.0	-4.09E-03	7.99E-04	-7.11E-05
3990.71351	3.	10 3 7	9 3 6	4.00E-02	3.	4.09E-02	-2.3	2.02E-01	-7.92E-06	1.05E-04
3991.17670	0.	12 6 7	11 6 6	1.49E-04	2.	1.49E-04	0.	1.26E-02	-3.58E-04	-4.73E-05
3992.66825	3.	12 2 10	11 2 9	6.70E-03	3.	6.47E-03	3.4	8.06E-02	-1.59E-04	-1.33E-06
3994.84305	-18.	12 6 6	11 6 5	4.30E-04	3.	4.40E-04	-2.4	2.17E-02	-6.39E-04	-8.29E-05

Table 10 continued

observed frequency	upper o-c	J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(001)	Z(100)	Z(020)
3995.02730	-25.	10	4	6	9	4	5	1.82E-02	4.	1.81E-02	.6	1.31E-01	2.69E-03	7.01E-04
3995.96945	-8.	10	5	5	10	3	8	1.55E-05	3.	1.41E-05	9.1	-4.34E-03	6.59E-04	-7.73E-05
3997.82504	50.	7	6	2	7	4	3	3.22E-05	2.	3.66E-05	-13.6	-7.66E-03	1.75E-03	-1.45E-04
3998.83305	-7.	12	4	9	11	4	8	9.12E-04	2.	8.98E-04	1.5	3.03E-02	-3.39E-04	-3.41E-05
3998.89018	-21.	12	5	8	11	5	7	3.67E-04	2.	3.75E-04	-2.1	1.99E-02	-4.68E-04	-5.29E-05
3999.68462	21.	8	6	2	8	4	5	2.40E-05	3.	2.50E-05	-4.2	-6.30E-03	1.43E-03	-1.28E-04
3999.74858	7.	13	7	7	12	7	6	3.95E-05	3.	3.60E-05	8.8	6.29E-03	-1.21E-04	-1.71E-04
4000.20420	13.	7	3	4	7	1	7	8.90E-05	2.	9.06E-05	-1.8	-1.03E-02	8.65E-04	-3.91E-05
4000.73090	26.	13	7	6	12	7	5	1.30E-05	10.	1.23E-05	5.6	3.67E-03	-8.17E-05	-8.90E-05
4002.76820	-20.	14	2	13	13	2	12	4.62E-04	3.	4.62E-04	.1	2.15E-02	-3.09E-05	1.65E-06
4002.86120	-5.	14	1	13	13	1	12	1.38E-03	2.	1.40E-03	-1.2	3.74E-02	-5.49E-05	7.52E-06
4002.96797	-3.	13	3	11	12	3	10	1.83E-03	2.	1.80E-03	1.8	4.25E-02	-1.40E-04	-5.34E-06
4003.12850	8.	6	6	0	6	4	3	2.09E-05	3.	2.51E-05	-20.0	-6.54E-03	1.66E-03	-1.31E-04
*4003.58930	59.	15	1	15	14	1	14	1.81E-03	4.	1.80E-03	.6	4.24E-02	-2.00E-05	2.30E-06
4004.70534	0.	13	2	11	12	2	10	6.29E-04	2.	6.10E-04	3.0	2.48E-02	-6.05E-05	2.46E-07
4005.48730	10.	11	3	8	10	3	7	4.21E-03	2.	4.16E-03	1.2	6.45E-02	-1.22E-05	2.24E-05
4005.67920	71.	14	8	7	13	8	6	8.86E-07	10.	9.37E-07	-5.7	1.04E-03	-7.27E-05	1.36E-06
4005.91880	6.	14	8	6	13	8	5	2.60E-06	7.	2.99E-06	-15.0	1.82E-03	-8.99E-05	2.58E-06
4006.63110	-58.	9	4	5	9	2	8	3.51E-06	10.	3.09E-06	12.0	-2.28E-03	5.99E-04	-8.04E-05
4008.57135	7.	6	3	3	5	1	4	6.26E-02	3.	6.24E-02	.3	2.53E-01	-2.47E-03	-4.89E-04
4010.83459	-37.	13	6	8	12	6	7	1.18E-04	2.	1.16E-04	1.6	1.12E-02	-4.06E-04	-4.35E-05
4012.69466	5.	4	4	0	3	2	1	1.47E-02	5.	1.47E-02	-.3	1.24E-01	-3.41E-03	3.24E-04
4014.07811	0.	13	4	10	12	4	9	7.42E-04	2.	7.36E-04	.8	2.74E-02	-2.85E-04	-1.98E-05
4014.45252	-4.	12	5	7	11	5	6	9.12E-04	2.	8.89E-04	2.6	3.12E-02	-1.23E-03	-1.39E-04
4015.38622	-5.	11	4	7	10	4	6	2.62E-03	2.	2.54E-03	2.9	4.97E-02	6.28E-04	1.14E-04
4015.54974	-22.	15	1	14	14	1	13	1.19E-04	2.	1.20E-04	-.5	1.10E-02	-1.81E-05	6.22E-07
4015.85533	-19.	14	3	12	13	3	11	1.57E-04	2.	1.60E-04	-1.9	1.26E-02	-2.22E-05	2.04E-05
4016.81427	0.	14	2	12	13	2	11	4.63E-04	2.	4.87E-04	-5.1	2.20E-02	1.74E-05	-4.52E-07
4017.03585	-4.	12	3	9	11	3	8	3.39E-03	3.	3.42E-03	-.7	5.85E-02	-5.36E-05	1.32E-05
4018.24000	-13.	13	6	7	12	6	6	3.82E-05	2.	3.72E-05	2.7	6.37E-03	-2.50E-04	-2.58E-05
4018.51545	1.	4	4	1	3	2	2	4.44E-03	4.	4.58E-03	-3.2	6.95E-02	-1.99E-03	1.91E-04
4019.46646	19.	5	3	3	4	1	4	3.00E-02	4.	2.81E-02	6.2	1.70E-01	-2.76E-03	5.24E-04
4019.92420	8.	5	4	2	5	0	5	3.41E-05	4.	3.90E-05	-14.4	7.71E-03	-1.57E-03	1.13E-04
4021.63870	8.	14	7	7	13	7	6	8.60E-06	10.	9.47E-06	-10.1	3.22E-03	-5.87E-05	-8.95E-05
4024.41860	38.	15	8	8	14	8	7	6.17E-07	10.	7.70E-07	-24.8	8.37E-04	1.01E-04	-6.05E-05
4025.35130	-11.	6	2	4	5	0	5	4.60E-02	5.	4.63E-02	-.6	2.17E-01	-2.17E-03	6.36E-05
4026.77620	5.	13	3	10	12	3	9	2.87E-04	3.	2.84E-04	1.1	1.69E-02	-3.52E-05	2.96E-06
4027.93720	-15.	14	4	11	13	4	10	6.05E-05	3.	5.99E-05	1.0	7.82E-03	-7.39E-05	-3.52E-06
4027.98770	11.	15	2	13	14	2	12	3.21E-05	3.	3.79E-05	-18.2	6.18E-03	-2.09E-05	1.46E-07
4028.17880	22.	16	1	15	15	1	14	7.90E-05	6.	8.40E-05	-6.4	9.18E-03	-1.75E-05	2.33E-06
4028.25661	1.	15	3	13	14	3	12	1.14E-04	2.	1.13E-04	.9	1.07E-02	-4.63E-05	-1.46E-06
4029.42840	-16.	14	6	9	13	6	8	1.05E-05	10.	8.87E-06	15.5	3.13E-03	-1.36E-04	-1.21E-05
*4029.52400	0.	17	1	17	16	1	16	1.07E-04	2.	1.07E-04	-.3	1.04E-02	-3.16E-05	1.40E-07
4029.77970	16.	5	4	1	4	2	2	8.38E-03	3.	8.50E-03	-1.4	9.38E-02	-1.85E-03	2.30E-04
4033.25900	-7.	14	5	10	13	5	9	2.37E-05	2.	2.54E-05	-7.0	4.97E-03	8.89E-05	-2.39E-05
4034.53824	-5.	12	4	8	11	4	7	2.22E-03	2.	2.20E-03	.9	4.65E-02	3.81E-04	5.60E-05
4035.35121	-4.	13	5	8	12	5	7	5.15E-05	3.	4.94E-05	4.1	7.68E-03	-5.99E-04	-5.47E-05
4036.35793	-1.	14	3	11	13	3	10	1.81E-04	2.	2.10E-04	-16.1	1.45E-02	3.06E-05	9.25E-06
4038.38140	11.	15	7	9	14	7	8	1.77E-06	4.	1.91E-06	-7.9	1.41E-03	-1.48E-06	-3.07E-05
4040.36800	0.	17	2	16	16	2	15	1.75E-05	2.	1.85E-05	-5.7	4.25E-03	-2.95E-06	5.03E-05
4040.37500	-50.	17	1	16	16	1	15	5.83E-06	2.	6.01E-06	-3.1	2.46E-03	-4.60E-06	1.58E-07
4040.66460	-4.	15	4	12	14	4	11	3.95E-05	3.	4.04E-05	-2.2	6.40E-03	-9.40E-07	-3.95E-05
*4041.92310	0.	18	0	18	17	0	17	2.24E-05	3.	2.29E-05	-2.1	4.80E-03	-9.25E-08	-1.40E-05
4042.30390	0.	14	6	8	13	6	7	2.46E-05	2.	2.73E-05	-11.1	5.42E-03	-1.78E-04	-1.70E-05
4043.77745	-3.	7	3	4	6	1	5	1.49E-02	6.	1.48E-02	.5	1.24E-01	-1.80E-03	-1.19E-04
4044.85916	10.	6	4	2	5	2	3	3.03E-02	2.	3.03E-02	.0	1.76E-01	-2.17E-03	4.17E-04
4044.90985	11.	5	4	2	4	2	3	2.00E-02	2.	2.09E-02	-4.4	1.47E-01	-3.24E-03	4.14E-04
4045.27640	0.	15	3	12	14	3	11	1.34E-05	5.	1.47E-05	-9.8	3.85E-03	-1.27E-05	9.65E-07
4048.17760	1.	8	3	5	8	1	8	2.55E-05	3.	2.50E-05	1.9	-6.02E-03	1.09E-03	-6.68E-05
4048.33872	0.	15	5	11	14	5	10	1.46E-05	2.	1.46E-05	-.2	3.96E-03	-1.28E-04	-8.51E-06
4050.36820	0.	13	4	9	12	4	8	1.78E-04	3.	1.75E-04	1.7	1.32E-02	6.86E-05	9.20E-06
4051.56600	21.	17	3	15	16	3	14	4.80E-06	10.	4.81E-06	-.1	2.18E-03	1.20E-05	8.51E-07
4051.74340	0.	17	2	15	16	2	14	1.55E-06	10.	1.59E-06	-2.3	1.26E-03	-6.15E-06	2.15E-07
4052.52200	0.	16	4	13	15	4	12	2.70E-06	7.	2.67E-06	1.0	1.66E-03	-1.98E-05	-7.06E-07
*4053.94120	0.	19	1	19	18	1	18	4.40E-06	4.	4.53E-06	-2.8	2.12E-03	9.72E-06	9.65E-07
4055.14220	21.	16	3	13	15	3	12	8.20E-06	8.	7.03E-06	14.3	-2.64E-03	-9.62E-06	-2.69E-06
4060.37727	11.	7	4	3	6	2	4	9.29E-03	4.	9.30E-03	-.1	9.66E-02	-4.51E-04	2.36E-04
4060.60940	18.	6	3	4	5	1	5	6.95E-03	10.	6.61E-03	4.9	8.17E-02	-6.47E-04	2.81E-04
4062.42900	-1.	14	4	10	13	4	9	1.11E-04	2.	1.16E-04	-4.7	1.07E-02	9.30E-05	1.25E-05
4063.76500	-30.	17	4	14	16	4	13	1.33E-06	10.	1.46E-06	-9.4	1.20E-03	2.01E-05	-9.71E-06
4071.35500	17.	15	4	11	14	4	10	7.60E-06	10.	7.50E-06	1.3	2.72E-03	1.35E-05	1.86E-06
4073.85523	9.	6	4	3	5	2	4	6.70E-03	5.	6.68E-03	.3	8.27E-02	-1.21E-03	2.43E-04
4076.25890	-48.	14	5	9	13	5	8	5.64E-05	2.	6.22E-05	-10.4	7.47E-03	3.90E-04	2.93E-05
4078.50910	0.	16	4	12	15	4	11	3.27E-06	5.	3.28E-06	-.4	1.87E-03	-5.62E-05	3.78E-07
4079.39345	5.	8	4	4	7	2	5	1.91E-02	2.	1.90E-02	.4	1.37E-01	7.97E-04	3.94E-04
4081.25261	9.	7	2	5	6	0	6	6.18E-03	4.	6.26E-03	-1.2	8.01E-02	-1.08E-03</td	

Table 10 continued

observed frequency	upper o-c	J K <sub>a</sub> K <sub>c</sub>	lower J K <sub>a</sub> K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t	Z(001)	Z(100)	Z(020)
4084.85534	10.	5 5 0	4 3 1	1.60E-03	2.	1.66E-03	-3.9	4.20E-02	-1.37E-03	1.95E-04
4086.17644	7.	5 5 1	4 3 2	4.69E-03	3.	4.95E-03	-5.5	7.24E-02	-2.38E-03	3.39E-04
4086.50850	-37.	16 6 10	15 6 9	7.90E-07	10.	8.83E-07	-11.8	9.37E-04	2.67E-06	8.66E-08
4088.08950	18.	4 4 0	3 0 3	1.92E-04	4.	1.94E-04	-.9	-1.45E-02	6.80E-04	-7.64E-05
4088.12631	10.	8 3 5	7 1 6	1.83E-02	2.	1.84E-02	-.6	1.38E-01	-2.49E-03	-4.70E-05
4103.88460	-3.	16 5 11	15 5 10	2.00E-06	10.	1.73E-06	13.7	1.24E-03	7.21E-05	4.90E-06
4104.10542	2.	9 4 5	8 2 6	2.93E-03	2.	2.92E-03	-.5	5.22E-02	1.53E-03	2.24E-04
4104.76123	8.	6 5 1	5 3 2	7.01E-03	3.	7.20E-03	-2.8	8.63E-02	-1.80E-03	3.66E-04
4106.02127	12.	7 3 5	6 1 6	1.19E-02	2.	1.21E-02	-2.1	1.10E-01	-1.34E-04	3.59E-04
4106.06338	5.	7 4 4	6 2 5	1.39E-02	2.	1.42E-02	-2.2	1.20E-01	-7.40E-04	3.74E-04
4109.55832	6.	6 5 2	5 3 3	2.26E-03	2.	2.32E-03	-2.6	4.90E-02	-1.04E-03	2.16E-04
4114.37850	42.	9 5 5	9 1 8	2.60E-06	7.	2.91E-06	-11.9	-1.16E-03	6.07E-04	6.32E-05
4121.37112	-2.	7 5 2	6 3 3	2.37E-03	3.	2.32E-03	2.1	4.85E-02	-4.92E-04	1.85E-04
4123.50670	38.	5 4 1	4 0 4	1.66E-04	2.	1.74E-04	-5.0	-1.36E-02	4.77E-04	-7.52E-05
4133.68342	1.	7 5 3	6 3 4	6.30E-03	2.	6.39E-03	-1.4	8.04E-02	-8.28E-04	3.36E-04
4134.68756	2.	8 5 3	7 3 4	5.37E-03	2.	5.38E-03	-.2	7.31E-02	-4.36E-05	2.51E-04
4138.81884	13.	8 2 6	7 0 7	7.56E-03	4.	7.58E-03	-.3	8.83E-02	-1.36E-03	9.85E-05
4139.39092	2.	9 3 6	8 1 7	2.06E-03	2.	2.07E-03	-.3	4.64E-02	-9.33E-04	1.25E-05
4141.92974	18.	8 4 5	7 2 6	2.71E-03	2.	2.70E-03	.5	5.16E-02	1.77E-04	1.70E-04
4146.34287	6.	9 5 4	8 3 5	1.20E-03	2.	1.17E-03	2.8	3.38E-02	2.80E-04	1.05E-04
4146.90820	-12.	9 4 6	9 0 9	4.80E-06	7.	4.06E-06	15.3	-1.56E-03	-5.10E-04	5.27E-05
4149.51192	-12.	6 6 0	5 4 1	1.29E-03	2.	1.35E-03	-4.9	3.75E-02	-1.05E-03	2.77E-04
4149.73820	2.	6 6 1	5 4 2	4.39E-04	2.	4.49E-04	-2.3	2.16E-02	-6.04E-04	1.60E-04
4153.34148	9.	10 4 6	9 2 7	1.36E-03	2.	1.42E-03	-4.7	4.14E-02	-3.46E-03	-1.45E-04
4154.58785	2.	8 3 6	7 1 7	2.12E-03	2.	2.12E-03	-.1	4.59E-02	9.53E-06	1.31E-04
4154.99100	213.	11 6 6	11 2 9	1.76E-06	10.	1.33E-06	24.6	-1.03E-03	-1.43E-04	2.00E-05
4159.17875	8.	10 5 5	9 3 6	1.89E-03	2.	1.90E-03	-.4	4.27E-02	7.67E-04	1.27E-04
4159.34906	-1.	8 5 4	7 3 5	1.46E-03	2.	1.48E-03	-1.6	3.83E-02	2.08E-05	1.54E-04
4166.02205	22.	6 4 2	5 0 5	5.75E-04	2.	5.78E-04	-.5	-2.44E-02	5.03E-04	-1.49E-04
4171.28862	-20.	7 6 1	6 4 2	5.64E-04	2.	5.80E-04	-2.7	2.42E-02	-2.75E-04	1.62E-04
4172.33693	7.	7 6 2	6 4 3	1.68E-03	2.	1.72E-03	-2.6	4.17E-02	-4.74E-04	2.81E-04
4173.64200	46.	11 5 7	11 1 10	2.20E-06	10.	2.06E-06	6.4	-1.29E-03	-1.70E-04	2.38E-05
4176.38253	11.	11 5 6	10 3 7	2.73E-04	3.	2.73E-04	-.1	1.60E-02	5.13E-04	4.94E-05
4181.47663	18.	9 4 6	8 2 7	3.81E-03	2.	3.81E-03	.0	6.07E-02	7.76E-04	2.03E-04
4187.34171	-1.	9 5 5	8 3 6	2.48E-03	2.	2.50E-03	-.7	4.92E-02	5.79E-04	1.92E-04
4191.15575	-9.	8 6 2	7 4 3	1.46E-03	3.	1.48E-03	-1.1	3.81E-02	1.07E-04	2.28E-04
4193.20180	108.	5 5 0	4 1 3	4.36E-06	6.	5.32E-06	-22.0	-2.42E-03	1.41E-04	-2.84E-05
4193.87075	5.	11 4 7	10 2 8	2.11E-04	2.	2.20E-04	-4.2	1.57E-02	-8.73E-04	-1.43E-05
4194.55305	5.	10 3 7	9 1 8	1.93E-03	2.	1.95E-03	-1.3	4.51E-02	-8.88E-04	4.16E-05
4194.60363	-3.	8 6 3	7 4 4	4.83E-04	2.	4.85E-04	-.4	2.18E-02	7.15E-05	1.33E-04
4195.73054	-8.	9 2 7	8 0 8	1.02E-03	2.	1.00E-03	1.8	3.21E-02	-4.91E-04	5.16E-05
4200.22452	5.	12 5 7	11 3 8	2.64E-04	3.	2.72E-04	-2.8	1.55E-02	9.30E-04	5.62E-05
4204.84040	11.	9 3 7	8 1 8	2.84E-03	2.	2.87E-03	-.9	5.35E-02	-8.91E-05	1.38E-04
4207.61300	0.	7 7 0	6 5 1	8.98E-05	2.	9.47E-05	-5.5	9.69E-03	-6.69E-05	1.09E-04
4207.64660	13.	7 7 1	6 5 2	2.64E-04	2.	2.84E-04	-7.7	1.68E-02	-1.16E-04	1.88E-04
4208.06780	5.	9 6 3	8 4 4	3.20E-04	3.	3.27E-04	-2.1	1.77E-02	2.62E-04	9.39E-05
4214.11610	42.	6 5 1	5 1 4	7.09E-05	3.	7.64E-05	-7.7	-8.91E-03	2.61E-04	-9.02E-05
4216.45470	64.	7 4 3	6 0 6	1.13E-04	2.	1.16E-04	-2.7	-1.07E-02	-1.81E-05	-7.58E-05
4216.93279	-1.	9 6 4	8 4 5	9.46E-04	2.	9.43E-04	.3	3.00E-02	4.97E-04	1.68E-04
4218.25270	3.	10 5 6	9 3 7	3.83E-04	3.	3.81E-04	.5	1.90E-02	4.51E-04	7.25E-05
4221.28940	-5.	10 6 4	9 4 5	5.18E-04	3.	5.37E-04	-3.7	2.25E-02	5.54E-04	1.04E-04
4224.34224	9.	10 4 7	9 2 8	5.05E-04	2.	5.14E-04	-1.9	2.22E-02	4.27E-04	7.19E-05
4230.12354	0.	8 7 1	7 5 2	3.23E-04	2.	3.40E-04	-5.3	1.80E-02	2.60E-04	1.82E-04
4230.16790	-42.	13 5 8	12 3 9	2.40E-05	3.	2.22E-05	7.7	4.15E-03	5.39E-04	2.05E-05
4230.31140	-1.	8 7 2	7 5 3	1.08E-04	3.	1.13E-04	-5.0	1.04E-02	1.51E-04	1.05E-04
4231.25390	27.	11 6 5	10 4 6	8.05E-05	3.	8.44E-05	-4.8	8.86E-03	2.90E-04	3.58E-05
4232.88200	53.	8 5 3	8 1 8	4.80E-06	7.	4.05E-06	15.7	-1.79E-03	-2.47E-04	2.49E-05
4236.79250	-23.	8 6 2	8 2 7	4.05E-06	3.	3.64E-06	10.2	-1.72E-03	-2.12E-04	2.23E-05
4239.88140	0.	12 6 6	11 4 7	1.00E-04	2.	1.04E-04	-3.5	9.75E-03	3.94E-04	3.42E-05
4239.93337	-7.	10 6 5	9 4 6	1.59E-04	3.	1.66E-04	-4.3	1.24E-02	3.62E-04	6.36E-05
4240.01445	18.	7 5 2	6 1 5	4.93E-05	2.	5.14E-05	-4.2	-7.13E-03	3.27E-05	-6.51E-05
4242.88206	-1.	12 4 8	11 2 9	1.89E-04	3.	1.93E-04	-.9	1.45E-02	-5.83E-04	6.04E-06
4250.08930	8.	13 6 7	12 4 8	1.13E-05	7.	1.21E-05	-6.9	3.30E-03	1.64E-04	1.02E-05
4250.61852	0.	11 3 8	10 1 9	1.99E-04	3.	2.01E-04	-1.0	1.44E-02	-2.35E-04	2.25E-05
4250.89157	2.	10 2 8	9 0 9	1.17E-03	3.	1.17E-03	-.2	3.46E-02	-4.66E-04	7.04E-05
4251.57080	0.	9 7 2	8 5 3	8.47E-05	2.	8.75E-05	-3.3	8.99E-03	2.84E-04	8.29E-05
4252.30815	-5.	9 7 3	8 5 4	2.48E-04	2.	2.62E-04	-5.8	1.56E-02	4.95E-04	1.44E-04
4252.36122	1.	11 5 7	10 3 8	4.24E-04	2.	4.43E-04	-4.4	2.02E-02	7.22E-04	7.40E-05
4255.74514	-1.	10 3 8	9 1 9	3.77E-04	3.	3.83E-04	-1.6	1.96E-02	-7.05E-05	4.99E-05
4259.45900	112.	9 6 3	9 2 8	1.27E-06	10.	1.06E-06	16.7	-9.49E-04	-8.94E-05	1.03E-05
*4259.56200	110.	8 8 0	7 6 1	6.12E-05	2.	6.25E-05	-2.2	7.46E-03	3.22E-04	1.28E-04
4264.31728	-1.	11 6 6	10 4 7	2.09E-04	3.	2.18E-04	-4.2	1.41E-02	5.87E-04	6.58E-05
4269.76579	10.	11 4 8	10 2 9	5.61E-04	2.	5.55E-04	1.1	2.30E-02	4.82E-04	6.95E-05
4271.40125	20.	10 7 3	9 5 4	1.45E-04	2.	1.56E-04	-7.9	1.19E-02	5.34E-04	9.99E-05
4272.83020	11.	8 5 3	7 1 6	2.10E-04	2.	1.64E-04	21.8	-1.24E-02	-2.55E-04	-1.07E-04
4273.68045	-18.	10 7 4	9 5 5	5.08E-05	3.	5.17E-05	-1.8	6.82E-03	3.14E-04	5.81E-05

Table 10 continued

observed frequency	upper o-c	J	K <sub>a</sub>	K <sub>c</sub>	lower J	K <sub>a</sub>	K <sub>c</sub>	observed strength	t <sub>s</sub>	computed strength	(o-c)t <sub>s</sub>	Z(001)	Z(100)	Z(020)
4275.55980	12.	8	4	4	7	0	7	1.31E-04	2.	1.27E-04	2.9	-1.07E-02	-5.07E-04	-9.26E-05
4282.43650	-12.	9	8	2	8	6	3	4.97E-05	2.	5.41E-05	-8.9	6.80E-03	4.58E-04	9.40E-05
4287.89190	116.	10	6	4	10	2	9	1.98E-06	3.	2.03E-06	-2.7	-1.35E-03	-8.88E-05	1.15E-05
4288.80470	-38.	11	7	4	10	5	5	2.58E-05	6.	2.52E-05	2.4	4.72E-03	2.59E-04	3.63E-05
4289.60670	6.	12	5	8	11	3	9	4.78E-05	2.	4.91E-05	-2.8	6.68E-03	3.08E-04	2.26E-05
4290.74500	25.	12	6	7	11	4	8	2.95E-05	3.	2.69E-05	8.9	4.90E-03	2.66E-04	2.04E-05
4294.64720	7.	11	7	5	10	5	6	6.92E-05	3.	7.46E-05	-7.7	8.11E-03	4.66E-04	6.35E-05
4295.81370	-5.	13	4	9	12	2	10	1.48E-05	4.	1.66E-05	-12.1	4.18E-03	-1.15E-04	5.39E-06
4302.87790	-11.	12	7	5	11	5	6	2.84E-05	2.	3.04E-05	-7.1	5.17E-03	3.11E-04	3.58E-05
4304.27122	-1.	11	2	9	10	0	10	1.45E-04	4.	1.43E-04	1.7	1.20E-02	-1.29E-04	2.90E-05
4304.44930	10.	10	8	2	9	6	3	3.41E-05	2.	3.90E-05	-14.4	5.69E-03	4.89E-04	6.49E-05
4304.58590	8.	10	8	3	9	6	4	1.18E-05	5.	1.30E-05	-10.2	3.29E-03	2.82E-04	3.74E-05
4305.41132	-5.	12	3	9	11	1	10	1.70E-04	3.	1.81E-04	-6.4	1.36E-02	-1.46E-04	2.88E-05
*4305.58240	4.	9	9	1	8	7	2	7.50E-06	6.	8.17E-06	-9.0	2.42E-03	3.67E-04	7.08E-05
4306.71776	6.	11	3	9	10	1	10	4.15E-04	3.	4.29E-04	-3.3	2.07E-02	-8.78E-05	5.46E-05
4313.15000	-22.	13	7	6	12	5	7	2.95E-06	6.	3.39E-06	-15.0	1.73E-03	1.05E-04	1.05E-05
4313.61040	25.	9	5	4	8	1	7	3.47E-05	4.	3.43E-05	1.1	-5.52E-03	-2.87E-04	-4.68E-05
4315.62240	3.	12	7	6	11	5	7	9.10E-06	10.	9.83E-06	-8.0	2.92E-03	1.94E-04	2.06E-05
4316.72690	12.	12	4	9	11	2	10	5.88E-05	3.	5.95E-05	-1.1	7.54E-03	1.46E-04	2.15E-05
4319.68400	7.	13	6	8	12	4	9	2.27E-05	4.	2.56E-05	-12.6	4.72E-03	3.16E-04	1.69E-05
4325.43670	0.	11	8	3	10	6	4	5.92E-06	4.	7.11E-06	-20.1	2.40E-03	2.41E-04	2.29E-05
4325.91900	0.	11	8	4	10	6	5	1.88E-05	3.	2.13E-05	-13.5	4.16E-03	4.20E-04	3.97E-05
4327.54820	30.	10	5	5	10	1	10	1.50E-06	10.	1.45E-06	3.0	-1.15E-03	-5.99E-05	7.02E-06
*4328.73600	17.	10	9	1	9	7	2	8.16E-06	3.	9.63E-06	-18.0	2.62E-03	4.23E-04	5.70E-05
4329.61290	27.	13	5	9	12	3	10	4.05E-05	2.	4.32E-05	-6.7	6.23E-03	3.27E-04	1.87E-05
4337.17530	-8.	13	7	7	12	5	8	9.70E-06	4.	9.41E-06	3.0	2.85E-03	2.01E-04	1.63E-05
4339.98360	48.	8	6	2	7	2	5	7.60E-06	7.	8.69E-06	-14.3	-2.70E-03	-1.93E-04	-5.00E-05
4342.95370	25.	9	4	5	8	0	8	1.04E-05	2.	9.37E-06	9.9	-2.56E-03	-4.72E-04	-2.71E-05
4344.99330	63.	12	8	4	11	6	5	9.10E-06	10.	9.51E-06	-4.5	2.75E-03	3.08E-04	2.20E-05
*4345.93300	148.	10	10	0	9	8	1	1.00E-06	10.	8.60E-07	14.0	6.29E-04	2.57E-04	4.07E-05
4346.41350	20.	12	8	5	11	6	6	2.90E-06	10.	3.16E-06	-8.8	1.58E-03	1.79E-04	1.28E-05
4351.14900	13.	11	9	2	10	7	3	1.34E-06	3.	1.65E-06	-23.1	1.08E-03	1.84E-04	1.87E-05
4351.17200	-30.	11	9	3	10	7	4	4.03E-06	3.	4.95E-06	-22.9	1.87E-03	3.19E-04	3.24E-05
4351.33180	20.	14	6	9	13	4	10	2.10E-06	10.	2.35E-06	-11.9	1.42E-03	1.11E-04	3.97E-06
4356.22270	6.	12	2	10	11	0	11	1.42E-04	2.	1.47E-04	-3.2	1.22E-02	-9.09E-05	3.32E-05
4356.93200	40.	9	6	3	8	2	6	5.16E-06	3.	5.09E-06	1.4	-2.04E-03	-1.91E-04	-2.85E-05
4357.41270	-8.	12	3	10	11	1	11	4.76E-05	2.	4.94E-05	-3.9	7.04E-03	-2.43E-05	1.97E-05
4358.02780	-4.	13	3	10	12	1	11	1.68E-05	2.	1.68E-05	-3	4.11E-03	-1.73E-05	1.09E-05
4363.01850	30.	10	5	5	9	1	8	4.33E-05	3.	4.08E-05	5.7	-5.76E-03	-5.81E-04	-4.86E-05
4364.27860	16.	13	4	10	12	2	11	5.25E-05	3.	5.26E-05	-1	7.11E-03	1.23E-04	1.98E-05
4366.15660	-8.	13	8	6	12	6	7	3.30E-06	10.	3.52E-06	-6.5	1.66E-03	2.05E-04	1.14E-05
*4369.38640	-97.	11	10	2	10	8	3	1.14E-06	10.	1.10E-06	3.4	7.69E-04	2.50E-04	3.10E-05
4379.60350	22.	10	6	4	9	2	7	1.61E-05	10.	1.57E-05	2.7	-3.51E-03	-4.11E-04	-3.95E-05
4407.06890	64.	13	2	11	12	0	12	1.53E-05	3.	1.59E-05	-3.8	3.99E-03	-1.53E-05	1.20E-05
4407.62730	15.	13	3	11	12	1	12	4.56E-05	2.	4.79E-05	-5.1	6.91E-03	-1.01E-05	2.07E-05
4409.73920	114.	11	6	5	10	2	8	3.30E-06	10.	3.29E-06	.4	-1.57E-03	-2.33E-04	-1.45E-05
4411.76000	15.	14	4	11	13	2	12	4.50E-06	10.	4.79E-06	-6.5	2.15E-03	3.56E-05	6.02E-06
4421.51300	-74.	11	5	6	10	1	9	3.80E-06	10.	3.62E-06	4.8	-1.58E-03	-3.06E-04	-1.22E-05
4448.22700	182.	12	6	6	11	2	9	4.07E-06	4.	3.95E-06	2.9	-1.65E-03	-3.30E-04	-1.20E-05
4488.60020	25.	12	5	7	11	1	10	1.86E-06	6.	1.98E-06	-6.3	-9.85E-04	-4.20E-04	-1.94E-06

Computed frequencies ( $\text{cm}^{-1}$ ) derived from energy levels given in ref. 1 for the (000) state and Table 1 for the upper state. o-c, observed minus computed  $\times 10^5$

(o-c)t<sub>s</sub>, observed minus computed line strengths given in percent. Computed values are derived from constants obtained in this work.

Z(020), Z(100), Z(001) are the contributions of the three states from which the computed strengths are derived:

$$S(\text{calc.}) = [Z(020) + Z(100) + Z(001)]^2$$